

# Radio Control **CAR ACTION**

THE WORLD'S LEADING R/C CAR MAGAZINE

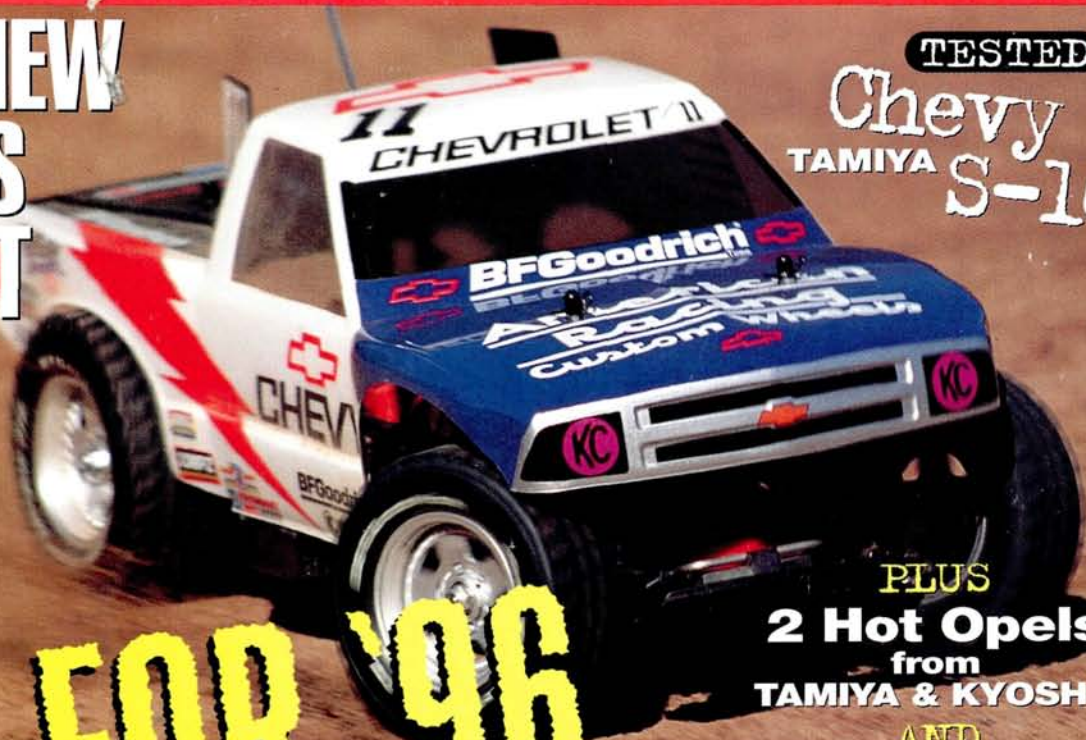
**BIGGEST ISSUE EVER!**

January 1996

**75 HOT NEW  
PRODUCTS  
YOU MUST  
HAVE**

pg. 132

**TESTED**  
**Chevy**  
**TAMIYA**  
**S-10**



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- Tune your touring car





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ON THE COVER: Tamiya's Chevy S-10 walks  
the wasteland (photo by John Howell).



## EDITORIAL

# Who's Really Steering This Ship?



It's hard to believe, but another year has gone by. That's 12 months of "Thrash Tests," product reviews, columns, interesting tidbits and mind-boggling features—all in your number-one R/C car magazine. As is customary in every January issue, we've taken on the enormous and difficult task of choosing the Reader's Ride of the Year. But how did we pick just one from the more than 100 that have appeared in the past year of *Car Action*? I'll tell you, it was a close race, but in the end, no one could dispute that Randy Coolbaugh's awesome T3 spy/assault vehicle was the most impressive in both design and execution. You'll see more on Randy's ride in this issue.

On to the big question: who's responsible for the contents of this magazine? It's you! We're just your humble editorial servants. It's you who tell us, through letters, faxes, e-mails and, yes, even "Readers' Rides," what should be on these pages.

You see, without a link to you, deciding what goes into the magazine every month would be a guessing game that would undoubtedly result in a mediocre magazine, at best. So if you're hesitant to write to us because you think, "Aww, these guys get so much mail, I bet they'll never read my letter," think again. We read every letter, fax and postcard that comes through our hallowed mail slot. Believe it!

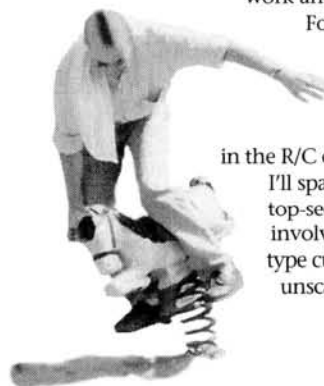
### New People and New Products

I'm extremely pleased to welcome George Gonzalez on board as a full-time, dyed-in-the-wool associate editor. If the name sounds familiar, it's because George has been a contributing writer for more than four years. He has always impressed us with the quality of his work and his knowledge of the hobby.

For his first assignment (and to see whether he could take the pressures of an editor's life), George helped Chris Chianelli and John Howell to compile this issue's mammoth "New for '96" epic saga. It highlights new goodies from all the major players in the R/C car industry, and you'll see it all here first.

I'll spare you the gory details about how we get this type of top-secret information, but, suffice it to say, this project involved hundreds of phone calls and lots of Jimmy Olsen-type cub reporting. As expected, George came through unscathed—Chris and John, on the other hand....

Frank Masi, Executive Editor



**We want to hear from you!** Write, fax, or e-mail us over the Internet: *Car Action*, Air Age Publishing, 251 Danbury Rd., Wilton, CT 06897; fax: (203) 762-9803; e-mail: Chris Chianelli—chris@airage.com; John Howell (Doog)—johnh@airage.com; Frank Masi—frankm@airage.com; George Gonzalez—georgeg@airage.com. Stacey Granelli: staceyg@airage.com

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## LETTERS

### QUIT YER GRIPIN'!

After reading your October '95 "Editorial" about racing, I started thinking about racing in general. It's unfortunate that more of the people involved in R/C cars do not get involved in racing. They don't know what they're missing! I was recently at a race where the track was on the rough side. A few of the racers decided that it wasn't suitable for racing and complained to the race directors. It was 103 degrees outside, but the argument got even hotter. It was horrible; racing is supposed to be fun! Furthermore, racers should not argue with the race director. People

seem to forget that we are racing off-road and not on dirty concrete. If it is the same for everybody, why should anybody care about the condition of the track? Last, under no circumstances, should an argument develop. Most track owners make very little profit off the race entries and will soon tire of racers' complaints about an off-road track being, actually, off-road with bumps, moguls and inconsistencies.

Many racetrack owners have probably given up business because of impolite, unappreciative racers. Racers of the world, have fun and let the race director worry

about the track; you'll become a better driver when you learn to race on slippery, adverse conditions.

**KHAL DAGHESTANI**  
Skokie, IL

Well, Khal, I couldn't have said it any better myself! I totally agree with everything you say—especially the part about everyone being equally matched on a rough track. That's so true! Frank and I received a phenomenal number of responses to that Editorial. It was pretty funny—some people took everything we said to heart; others knew we were being sarcastic and were joking. I have also been to tracks at which the racers were thrashin' on the track owner because, in their opinion, conditions were not "perfect." Fine, then; if you don't like it, go make your own "perfect" track and race on that. I'd like to see how quickly all those whining racers shut up when they hear the track owner say that his track is closing down and they'll have to find another place to race. You have the right attitude, Khal. Thanks for your input. *Doogie*

When it's time to rebuild your shocks, Andrew, your best bet is to buy a direct-replacement shock cartridge. It's the easiest and least complicated way to rebuild shocks. Inspect the shock shafts closely for damage (scratches and nicks), or you'll be replacing that shock cartridge again sooner than you might want to.

As for your other question: no one yet offers a 4WD conversion kit for the Losi Double-X. As far as I know, MIP was the only company that made a 4WD conversion kit for a 2WD buggy, and it was designed for an Associated RC10. If you're interested in 4WD, I recommend that you check out the Kyosho Lazer ZX-R, the Yokomo YZ-10, or the Schumacher Cat 2000 E.C.S. *Doogie*

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### DOUBLE-X-PLANATION!

You are the best in R/C cars, so maybe you can answer two questions I have. On the Losi Double-X buggy, the shock-cartridge body comes assembled with the O-rings inside. Do the O-rings have to be changed? If so, how do I get them out?

Also, is there a 4WD conversion for the Double-X buggy?  
**ANDREW MILLER**  
Union, KY

**WRITE TO US!** We welcome your photos, drawings, comments and suggestions. Letters should be addressed to "Letters," Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897-3035. Letters may be edited for clarity and brevity, and each must include a full name and address or telephone number so that the identity of the sender can be verified. We regret that, owing to the tremendous number of letters we receive, we can't respond to every one.

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## BLAZIN' INFERNO

David Feltner of Toledo, OH, sent us this shot of his Kyosho Turbo Inferno. It's equipped with Futaba radio gear, a Kyosho fuel warning light, full rubber sealed bearings and turnbuckles. On race days, it's powered by a Paris Racing modified Picco p5 buggy engine. But for photos, David prefers the OFNA Super Force 6 port, the red head of which matches his candy-red to candy-purple, three-tone-fade paint job. Now that's a stylin' wardrobe!

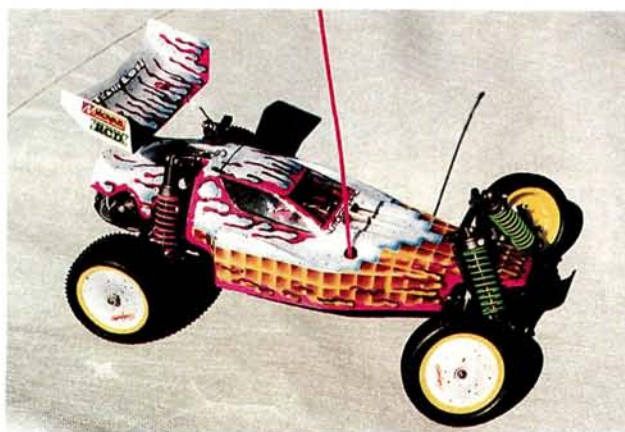


## WATCH OUT FOR THAT R/C T-REX!

It looks as if Dr. Grant took a wrong turn and ended up in Mike Rinck's backyard in The Dalles, OR. Actually, this is a Tamiya Jeep Wrangler made up like a Jurassic Park Jeep. What? You say you already knew that? Mike's Jeep has a Novak Rooster ESC, a Futaba 4NBL radio, a 20-tooth pinion gear, a Trinity EX Tech 16-turn double modified motor, and working headlights and fog lights. As a finishing touch, Mike added tires and wheels from Tamiya's Mitsubishi Pajero kit. Mike brush-painted the body and made the decals out of a poster. Now all you need are some R/C dinosaurs to complete the scene, Mike!



"Readers' Rides" is our way of recognizing the unique, innovative—and sometimes bizarre!—vehicles that our readers have created. Send us a sharp, uncluttered, well-exposed color photo of your car or truck (no Polaroids, please!), along with a brief description, to Readers' Rides, R/C Car Action, 251 Danbury Rd., Wilton, CT 06897. If we choose your photo, you'll receive a 6-month subscription to Car Action, or an extension of your existing subscription. You'll also be eligible for the fifth annual "Reader's Ride of the Year Contest" in the fall of 1996. Write your address and phone number on your letter and on the back of each photo you send, in case we need to contact you.



## JEFF'S GEM

This killer ride comes from Jeff Johnson of West Fargo, ND. His Losi Double-X has been modified with the following goodies: MIP CVDs, Tecnacraft titanium turnbuckles, a lightweight Losi motor plate and a lightweight Losi aluminum top shaft in the gearbox. Jeff has been painting bodies for almost 10 years, and this Dahm's Tiger X body sports his latest design.

## GO, GO STREET RACER

After thrashing monster trucks for 9 years, Kevin Hunt of East Leroy, MI, decided to join the street-racing crowd. Except for the Trinity Green Machine motor, his Tamiya Alfa Romeo 155 V6 is entirely stock. He painted the body with some guidance from R/C Car Action, and he says that now he can go racing in style. Have a blast, Kevin.







## A PAIR OF PULLERS

The husband and wife team of Dave and Carol Queen of Dearborn Heights, MI, runs these identical trucks in the dual-motor modified class at local pulling events. The "Wild Thing" and the "Twilight Zone" feature scratch-built chassis, two Pullmaster 4 motors, 14 Stage III matched cells and Futaba radio gear. These trucks can pull up to 450 pounds.



## LUCKY #7

This cool-lookin' Legend comes to us from Dee Dutro of Zanesville, OH. Dee's ride is set up with a Futaba radio system and ESC, a 6-cell battery pack and a closed-endbell Mabuchi 540 motor. Dee's husband, Fritz, and her son, Mike, also race identically equipped Legends in an informal group that runs weekly at a variety of tracks where they say it's common to have eight to 10 cars on the track at a time. Run times are 20 to 25 minutes, and the races they attend have gone 150 laps.



## GODZILLA

Felix Leung of Surrey, B.C., Canada, decided that it was time for an overhaul and facelift for his Tamiya Clod Buster. He added: a Tamiya ball-bearing kit; long, yellow shocks; flashing headlights; an ESP aluminum lower chassis brace, suspension stabilizers and lift kit; homemade front and rear aluminum lower bumper protectors and skid plates; aluminum, side, body guards; and a polished aluminum wing. The beast is powered by six, Sanyo, 4400mAh D-cells and controlled by KO radio gear. A Parma Hemi engine rests under the Parma Clod Buster Lexan body. Felix says it took him 1½ months to design and paint the body. Nice job Felix! It's a hot ride!



## SUPREME SAND RAIL

Is this a wild-lookin' machine or what? Dale Badger of Phoenix, AZ, sent us this photo of his completely scratch-built 1/10-scale sand rail. The rail has seats, pedals, a functional steering wheel, a gear stick (which is actually the on/off switch for the Futaba radio gear), lights and an O.S. .21 engine. The roll bar is made of mig-welded, chrome-plated 1/8-inch piano wire. Dale told us that he has received quite a few comments from a ton of people—understandably so! It's a nice-lookin' rig. Maybe we'll pass along another look to our readers in a future issue....





# INSIDE scoop

by Chris Chianelli

In search of fun  
and glory, 'cause  
life's too short  
to be a sheep

**H** EY, YOU, yeah, you! Pay attention! You product hounds who regularly turn to my pages for all the latest-breaking info on the really cool stuff that's just hitting the market, turn to our "New for '96" article in this issue. We've featured all the coolest stuff that will be coming out in the new year. Those of you who need to see some off-the-wall, out-of-the-ordinary stuff, stick around.

## "Scoop's" 10 Predictions for the New Year

1. Pro-Line will make a tire that will enable you to drive your R/C car on the ceiling.
2. Team Losi will replace the Double-X with the Double-U.
3. Tekin will produce an ESC that will not only give you 30 extra seconds of run time, but it will also help you with your calculus homework.
4. A new form of superspeedway racing will evolve: one of the 10 cars in the A-Main has to run the track backwards without hitting any of the other cars!
5. A future space-shuttle mission will consist of launching an issue of CAR ACTION into deep space in the hope of spreading ultimate coolness throughout the galaxy.
6. All Associated RC10GTs will be required to meet California emissions standards.
7. Tyco will produce a full-blown 2WD buggy and win the '96 Off-Road ROAR Nats.
8. All Team Losi and Team Associated drivers will miss their flights and show up a day late for the '96 Off-Road ROAR Nats.
9. Chris Chianelli will join the cast of "Friends."
10. We will meet all of our deadlines!

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## A New Losi Team

We always like to hear good news about good people, and this is one of those times! We just received word from the folks over at Team Losi that Gil Losi Jr. got married! Junior and his longtime girlfriend, Julie Rodgers, were married at his parents' house on September 16. Congratulations, Gil, we all wish you and Julie the very best!



**T**his mild-mannered-looking lad has proven to be a formidable 1/8-scale on-road driver. His name is Chris Tosolini, and he recently won his second consecutive ROAR 1/8-scale On-Road National Championship. To clinch his latest title, Chris battled the likes of gas-racing legends Ralph Burch and Art Carbonell. Expect to see more on Chris and his BMT car in this magazine (mostly because he lives near us and won't leave us alone!).

## 2-Timing Tosolini



## Attack of the Killer Apache



**I** just got a sneak peek at Kyosho's newest Hyper Fly helicopter, and it sure looks great. The Apache has the same features as the original Hyper Fly that I previewed in the March '95 "Scoop." For those of you who missed it, here it is again: the Apache Hyper Fly is an affordable, entry-level electric helicopter that has a basic, easy-to-understand gear train (the entire drive system, including the Le Mans AP29 motor, is factory-installed) and a fixed tail rotor. The Hyper Fly Apache is easy to assemble in a few hours with the tools that most R/C'ers already have on hand. All you need to get up and running is a 2-channel radio system (aircraft frequency) with servos, a 7.2V 1000mAh Ni-Cd battery and a charger.

## Watch Out for the Baby in the Buggy

**A**ware that his on-road, superstar-driver Joel Johnson will inevitably become too old to race someday, Trinity's Ernie Provetti went out scouting for new, up-and-coming drivers. We were told that this little driver was out with



a commanding lead over the other babies in their buggies. The tyke chalked up the win thanks, in part, to Trinity Zip Pak power! Just imagine if the baby buggy had been hit with some Trinity Buggy Grip traction compound; this "1/10-scale" driver might have lapped the entire field!

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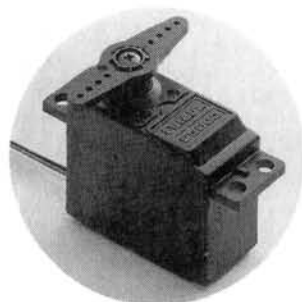


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# WHAT'S new



## FUTABA FP-S3003 Standard Servo

This new servo is standard equipment with Futaba's 2VR and 2CR 2-channel radio systems. It uses advanced design and manufacturing techniques to produce performance that's virtually identical to that of the popular S148—but at a more economical price.

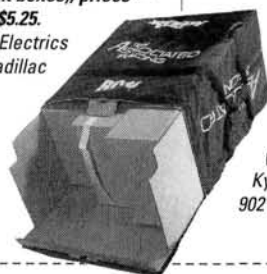
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(714) 455-9899.

## ASSOCIATED Car Carrier Boxes

Tote your gear like a Team driver. The new carrier bag is made of black nylon with a brass zipper. It features a heavy-duty carrying handle and is designed to fit over the heavy-duty carrier box. The carrier box is made of double-wall, corrugated cardboard and has been tested to carry up to 275 pounds; it comes with three 12x24x6-inch insert boxes.

**Part nos.—SP-415 (carrier bag only), SP-100 (carrier box with three insert boxes), SP-101 (replacement boxes); prices—\$39.95, \$15, \$5.25.**

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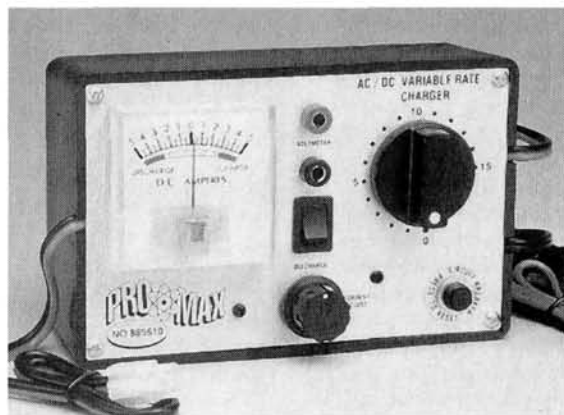


## KYOSHO "Pure Ten" GP 4WD Spider

This new 4WD falls under the "Pure Ten" designation; it's closer to scale and much more detailed than any other body/chassis configuration. It's available in two body styles—the Porsche 911 and the Nissan Skyline. A powerful GS-11X pull-start engine is included in the kit.

**Part nos.—KYOC0446 (Porsche 911 with GS-11X), KYOC0447 (Nissan Skyline with GS-11X); prices—\$349.99 each.**

Kyosho; distributed by Great Planes Model Distributors, P.O. Box 9021, Champaign, IL 61826-9021; (217) 398-6300; fax (217) 398-1104.



## GLOBAL HOBBY DISTRIBUTORS Pro-Max AC/DC Adjustable Current Charger

This reliable, economical charger can charge any 100 to 1800mAh, 4- to 8-cell Ni-Cd pack. Features include: adjustable charging rate; resettable circuit breaker; built-in jacks for monitoring voltage peak with a digital voltmeter; 15-minute mechanical timer; automatic trickle with indicator light; input clips that attach to a 110V AC source or a 12V DC source battery; cooling vents; tough polycarbonate case.

**Part no.—885610; price—\$64.99.**

Global Hobby Distributors, 10725 Ellis Ave., Fountain Valley, CA 92728-8610; (714) 963-0133; fax (714) 962-6452.

## TEKIN Titan

This high-power, high-frequency, reversing ESC features 12 GoldFET transistors for more speed. The QuickTune setup adjusts to your radio in seconds.

**Part no.—2110; price—\$210.**

Tekin Electronics, 940 Calle Negocio, San Clemente, CA 92673; (714) 498-9518; fax (714) 498-6339.



## TRINITY Midnight

This new 27-turn stock motor features: an internal Magnetic Flux Collector™; narrow cross-section bushings; a short-stack, slotted armature with Thermal Transfer Gateways™; a 1.3mm-thick can with v.5.2 wet magnets and cooling tunnels; pre-soldered, hard-compound, laydown brushes and capacitors; and removable, black-anodized heat sinks.

**Part no.—RC2095; price—\$39.99.**

Trinity Products Inc., 1901 E. Linden Ave. #8, Linden, NJ 07036; (908) 862-1705; fax (908) 862-6875.



Descriptions of the products shown here were taken from manufacturer and/or advertising agency press releases. The information given does not constitute an endorsement by **Radio Control Car Action** or guarantee product performance or safety. When contacting a manufacturer about any product described here, be sure to say you read about it in **Radio Control Car Action**. Manufacturers! To have your products mentioned here, send press releases to **R/C Car Action**, What's New, 251 Danbury Rd., Wilton, CT 06897.





## TROUBLE SHOOTING

by George M. Gonzalez

### HITTING ROCK BOTTOM

About a year ago, I bought a Tamiya Stadium Blitzer, and it has two problems: first, whenever it goes over a jump, its suspension bottoms out; second, whenever it goes around a turn, it spins out. Can you please help?

**BOBBY PHILLIPS**

*Anchorage, AK*

Thanks for the letter, Bobby. Here are a couple of tips: fill your shocks with high-quality, 100-percent-silicone shock fluid. Team Associated, Team Losi and Trinity offer this in an assortment of weights. Start with 30 to 40WT, which

will be considerably thicker than that used in the stock setup. This should take care of your bottoming-out problem.

It sounds as if your truck has a bad case of oversteer. In other words, your truck's front tires have more traction than the rear tires. To remedy this, install rear tires that have more traction.

You didn't mention what kind of surface you run your truck on, so I can't recommend rear tires

for you. Check out the ones that the fast guys use, and use them. I know this sounds kind of lame, but that's how I usually decide which tire combinations to use.



*If you have a technical problem that your hobby shop or racing friends can't resolve, give us a shout at Radio Control Car Action, and we'll see if we can chase down an answer for you. Questions should be of a technical nature and should be addressed to Troubleshooting, Radio Control Car Action, 251 Danbury Road, Wilton CT 06897. We regret that, owing to the tremendous number of letters we receive, we can't respond to every one.*

### LOUD AND OBNOXIOUS DIFF

I've been driving R/C cars for about three years now, and I recently bought an RC10T. I have a couple of questions. First, the slipper clutch is making a lot of noise. I've tried tightening it and loosening it, but that didn't help. I then rebuilt the slipper and diff, but the clutch still makes noise. What's wrong?

Also, which company makes an adapter kit that will allow me to put a Losi Hydra Drive on my truck? If you could help, I would really appreciate it.

**CRAIG HELLER**

*Manheim, PA*

First of all, Craig, the slipper and the diff have their own distinct sounds, and you have to know the difference between the two before you can fix the problem. The slipper has a smooth, whining sound, while the diff makes more of a rough screech. From your description, it sounds as if your diff may not be properly set. Before you check the diff, however, make sure that the slipper clutch has been set up correctly. Check for gaps in the slipper pad (it's between the two slipper-clutch pressure plates) by

simply rotating the spur gear and making sure that the slipper pad rotates true and that there aren't any gaps present. If it checks out, move on to the diff.

To test the diff, lock up the slipper clutch by tightening the adjustment nut until the coil spring collapses completely. Then place your truck on your driveway or carpet, and push down on the rear end so that the suspension bottoms out. While you're pushing down on the rear end, try to rotate the spur gear. It shouldn't move at all; if it does, you'll have to tighten the diff. The RC10T has a  $\frac{5}{64}$  diff-adjustment screw on the inside of the left outdrive (it could be on the right side if you installed the diff backward). Tighten the screw, then repeat the same process until the spur gear is almost impossible to rotate. If the diff continues to slip, you've probably stripped the diff nut; replace it before you damage the diff gear. Also, while you have the

diff apart, it's a good time to replace the diff balls and rings.

To adjust the slipper, loosen the slipper-adjustment nut until the slipper starts to slip. This setting will vary greatly, depending on the type of surface you drive your truck on; there is no way to set the slipper so that it works perfectly on all types of surfaces. I set up my slipper clutch to slip for approximately 3 feet before it engages the tranny, and this has proven to be a good starting point.

Now, let's move on to your Hydra Drive question. Team Losi offers a top shaft for the Stealth transmission that allows you to install the Hydra Drive traction-control unit on your truck, but I only recommend this hop-up if you plan to do some hard-core racing on bumpy tracks with hot modified motors. If you plan to bash around your neighborhood, you would be better off investing your hard-earned cash in more battery packs.





## FISH-TAILING XX-T

I race on a fairly demanding off-road course, and I'm having problems keeping the rear end of my Losi Double-XT planted on the track. When I turn a corner—even when I'm still in the groove—the truck's rear end does a major fishtail, and I lose all control and the speed carried through the turn. I've tried all kinds of suspension/shock setups—all with the same result. I've also tried transferring the battery from the front to the back of the truck to keep the tires biting. The track is concrete-hard, and I use Fuzzie rear tires. Sweeping the dirt "marbles" off the track helps a little, but I still can't make it to the podium because of poor traction. Please help me.

**CHAD ARNDT**  
Omaha, NE

Chad, I know this will sound sarcastic, but have you ever tried to slow down before you enter a

turn? Going into a turn fast and furious will only make matters worse and make the other racers angry when you plow them into the washboards. It's better to let off the throttle way before you enter a corner than to slam the brakes as you enter it. You can also try to adjust your steering

duel rate on your transmitter to give less steering. If this doesn't help, install lighter springs in the rear, or firmer springs up front. Also, try a different set of rear tires, and loosen up the slipper a tad. When I race, I always take along a variety of tires and springs, and I've yet to find a track that my Double-XT won't hook up on. I may not always

make the A-Main, but I rarely get frustrated because my truck isn't hooked up. You could also call Team Losi at (909) 465-9728 and speak to one of their team drivers for technical advice on shock piston and oil selection, camber-link locations and tire combinations. Good luck, and get dialed, dude.



## CRAZY WORLDS CAR

Please help! I own an RC10 Worlds Car. This is my first car. Every time I run it, it goes crazy when it's 15 feet away. Last night, I looked through some back issues of your

magazine and read about sending radios back to the company for re-tuning. Is this service free? I own an Airtronics XL2P, so I need the address for Airtronics. Any help you could pass along will be appreciated. Your magazine is the best!

**CHRIS OUCHIDA**  
Carmichael, CA

Chris, there is a charge to have your radio gear tuned, but you may be able to fix the problem yourself. First, you should have at least two capacitors installed on your motor. If you don't, get some! Check the condition of your motor brushes; worn-out brushes can cause radio interference. Next, install your receiver

in another location, such as on the shock tower. Also, try installing a new set of crystals, or borrow a set from a friend or a hobby shop to see whether that corrects the problem. If none of this helps...well, here's Airtronics' address: 11 Autry, Irvine, CA 92718.







## BOTTOMS DOWN!

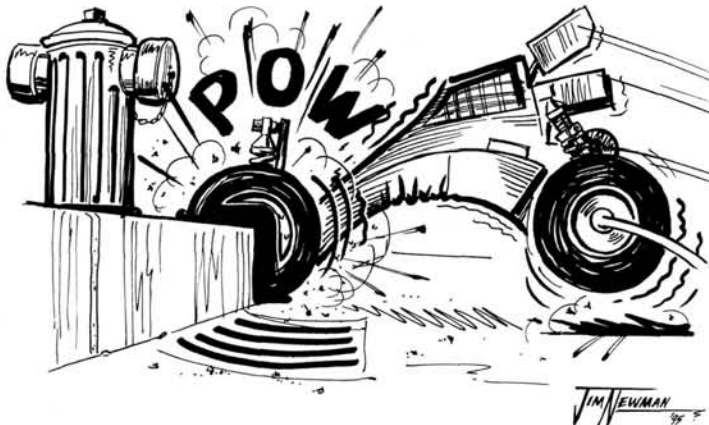
I own an RC10 Team Car with a stock motor and speed control. Whenever I run my car over a curb or a jump, it always bottoms out. How can I stop this?

Also, I'm thinking about racing. Do MIP CVDs for the RC10 really improve its performance?

**TIM SHAEFFER**  
San Diego, CA

If your car bottoms out too easily, the oil is the problem. Just as I say in "All Knuckles and Arms," the oil controls the speed at which the

suspension travels, and the spring controls ride height. Set the spring adjusters so that the suspension arms are about level, and try a thicker oil. With a little experimentation, you'll find an oil that will give you good damping and handling. The MIP CVD drive shafts are very nice; they provide better acceleration and handling, and they're smooth and beefy enough to last a while. They can also be rebuilt when something wears out.



JIM NEWMAN '98



JIM NEWMAN '98

## IN A BIND!

I've been driving R/C vehicles for about 6 years. Recently, my Tamiya Blackfoot's left front steering knuckle arm keeps breaking off where the ball connector and steering arm are screwed in. My truck is stock except for the Futaba 2PB radio system, Trinity Green Machine 2 motor and Novak Rooster ESC. How do I solve the knuckle-breaking problem?

Also, since I redid my Blackfoot, it has run hot. I can hold my hand on the motor only for 5 to 10 seconds. I installed a Holeshot Super Cooler 2000 heat sink, but that didn't help. I run the stock gear train and a 10-tooth pinion gear. My hobby shop says I should use a 13-tooth pinion gear because I'm geared too high. Can you help?

Great mag! Don't change a thing.  
**JAMIE BARNETT**  
Eminence, KY

I'm not sure why the part keeps breaking, but I assume you're hitting something. I don't know if there's a more heavy-duty version of those knuckles; maybe you can beef them up by making an aluminum brace out of scrap parts. And try a new servo-saver. If you use a larger pinion, the gearing problem will only get worse. If you go up to the 13-tooth, you'll gain a little speed, but your run times will suffer and things will get even hotter. A hot motor usually means the pinion is too large, so try a smaller one. Also, make sure that the drive system runs freely and doesn't bind anywhere.

## ALL KNUCKLES AND ARMS!

I own a Turbo Inferno, and I have noticed that if I tighten its suspension, the right and left front knuckle arms rub against the front suspension arms. I could loosen the suspension to stop this, but then I wouldn't be able to take off from jumps. How could I adjust my suspension? I'd appreciate help.

**JUSTIN CLARKE**  
Waterloo, Ontario,  
Canada

Well, Justin, the problem of the knuckle arms



SUSPENSION ADJUSTMENTS REQUIRED

JIM NEWMAN '98

rubbing the suspension arms isn't really a problem because it will only happen when the car is airborne. Don't adjust the springs to prevent the front end bottoming out. Use the spring adjustments only to set ride height—usually, the arms level with the ground. If you bottom out too much with this setting, shock oil is your problem. Try a thicker oil, or shock pistons with fewer or smaller holes. This will allow the car to handle the jumps with the suspension set correctly.



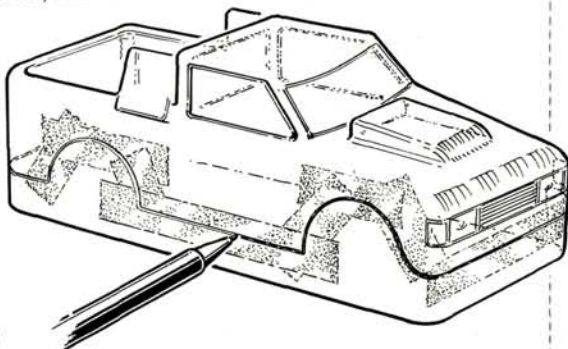


by Jim Newman

## VISIBLE LINES

Before you trim the scrap material off a transparent body shell, run masking tape or artist's white tape inside the body along the scribe lines, then run a fine marker pen along the lines to make them easy to see when you cut.

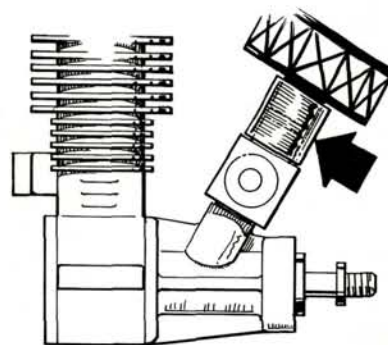
**MARK MCCLURE,**  
House Springs, MO



## FILTER ADAPTER

You can adapt a K&N air filter (or similar) for use on your .12 engine by using a short piece of plastic tubing (available at hobby stores in many sizes). Hold the tubing in place by twisting fine wire around it at the filter and carburetor throat.

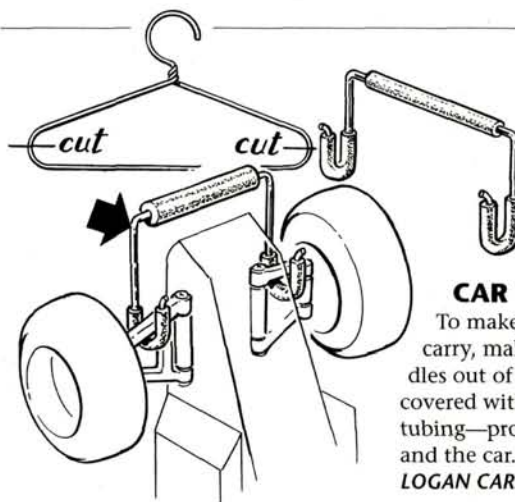
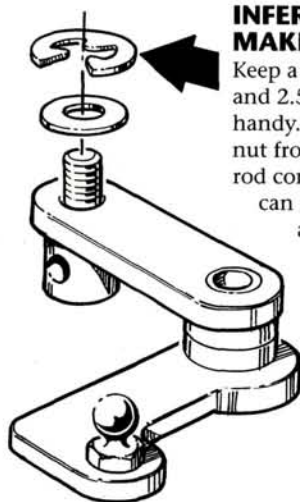
**GARY UNDERWOOD,** Abilene, TX



## INFERNO 10 MAKE-DO

Keep a few washers and 2.5mm E-clips handy. If you lose the nut from a steering-rod connector, you can replace it with a washer and an E-clip.

**KRIS SCHENK,**  
Woodstock,  
Ontario,  
Canada



## CAR TOTE HANDLES

To make your car easy to carry, make these simple handles out of wire coat hangers covered with plastic or rubber tubing—protects your fingers and the car.

**LOGAN CARSWELL,** Pataskala, OH

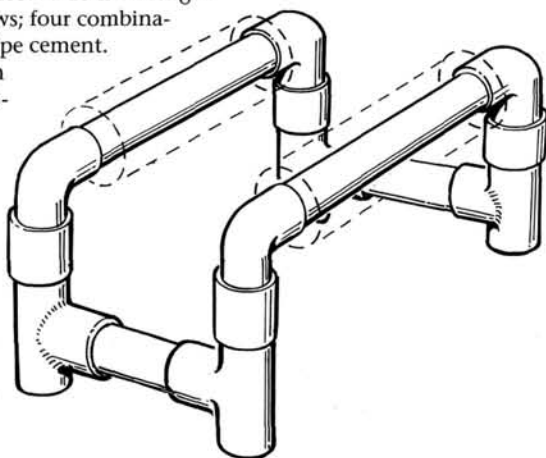
## PVC CAR STAND

Make this car stand entirely out of inexpensive, 1/2-inch (13mm) PVC plumbing pipe. You'll need: a 15-inch length of pipe; four 90-degree elbows; four combination "Ts"; four risers; PVC pipe cement.

Cut the pipe into two 6-inch (152mm) pieces and two 1.5-inch (38mm) pieces.

Assemble as shown, but do not glue the 1.5-inch lengths into place, because you want to be able to disassemble the stand and carry it flat. To protect your car, you can add foam pipe insulation (dashed lines) if you wish.

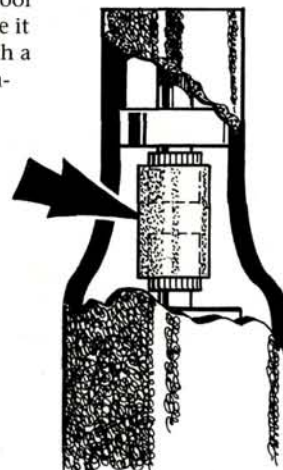
**DAN JOHNSON,**  
Las Vegas, NV



## DREMEL FLEX FIX

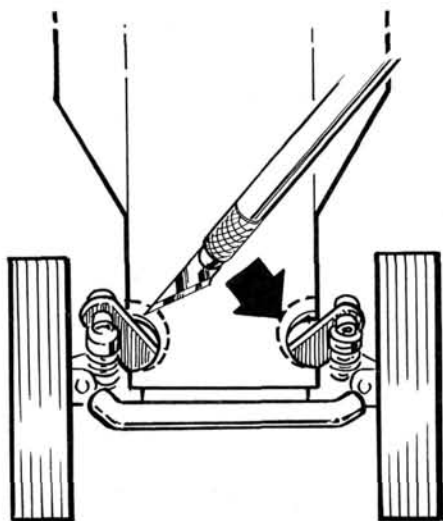
If the flexible coupling on your Dremel tool wears out, remove it and replace it with a section of 1/4-inch-i.d. latex-rubber tubing from a hardware store.

**JOHN BRIGHT,**  
Calgary,  
Alberta,  
Canada



**Radio Control Car Action** will give a one-year subscription (or one-year renewal if you already subscribe) for each idea used in "Pit Tips." Send a rough sketch to Jim Newman, c/o **Radio Control Car Action**, 251 Danbury Rd., Wilton, CT 06897-3035. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO AND NOTE YOU SUBMIT. We're unable to publish many good tips because we don't have the sender's name and address. Please note: because of the number of ideas we receive, we can neither acknowledge every one, nor can we return unused material.

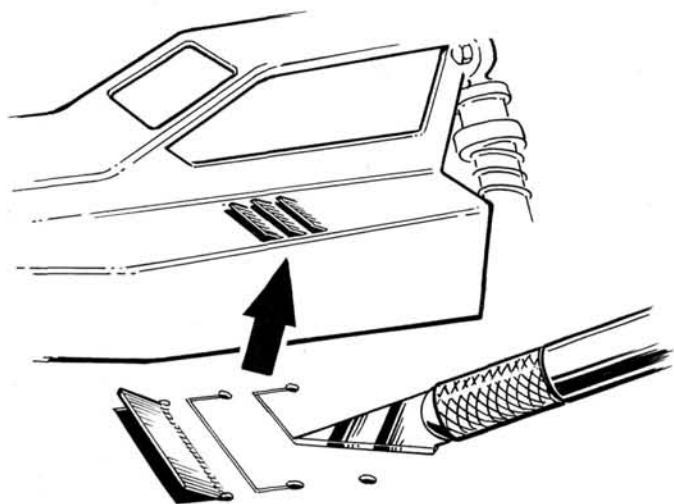




### SPEEDY BODY REMOVAL

When you race, quick pit stops are essential. To remove your vehicle's body faster and more easily, cut the body around the suspension posts to increase the clearance.

MATHEW THOMPSON, Ypsilanti, MI



### ESC COOLING LOUVERS

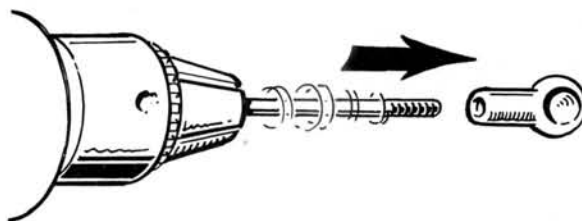
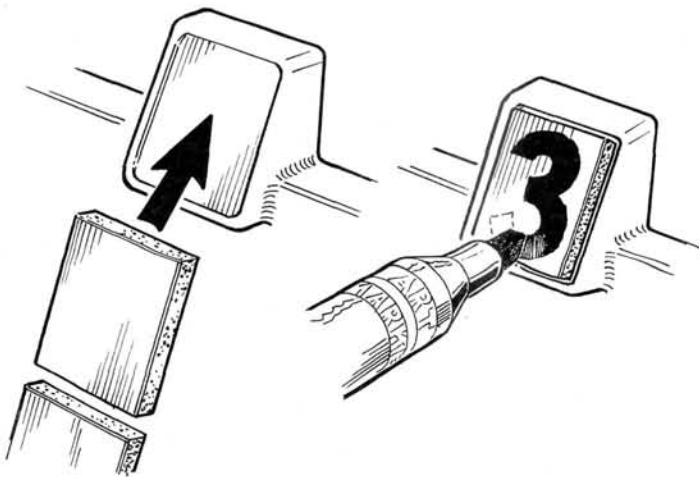
To make forward-facing louvers that will scoop air over an ESC's heat sinks, drill  $\frac{1}{16}$ -inch (1.5mm) holes, then connect the holes with knife cuts to make louvers, as shown. Pry up the "louvers" with a hobby knife, then grip them with flat-nose pliers to bend them as required.

WENDY MATSUDA, Oakland, CA

### INSTANT NUMBERS

Keep a roll of wide, foam servo tape and a permanent marker in your toolbox. If you need instant numbers, cut off a piece of tape that's the size you need, and stick it on your vehicle, leaving the paper in place on the tape. Write the number on the paper with the permanent marker.

JOE KRAMER, Elmwood Park, IL



### QUICK THREADING

To thread a tie rod quickly into a ball joint, hold the rod in the chuck of a variable-speed drill; then, with the drill turning very slowly, thread the rod into the joint as shown.

DUANE CHAVEY, Twisp, WA



### PRE-THREADED JOINTS

Use a rod to pre-cut left- and right-handed threads into your spare ball joints. Do not score the plastic, but use a waterproof pen to mark L and R (left and right) on the joints. Now, to avoid confusion in the heat of races, you can install all the lefts on the left and all the rights on the right.

CRAIG BAXTER, Waterloo, Ontario, Canada





## A Mixed Bag of Tricks

**T**HIS HAS BEEN a busy racing season for me. I've done some off-road truck and buggy racing and a lot of parking-lot, Tamiya\* and Formula-1 stuff on both carpet and asphalt. I even raced my Yokomo\* YR-4 4WD sedan on carpet in a short series

held at The Track—a terrific indoor facility in Gaithersburg, MD. I also have more tips for a broad range of vehicles that will make R/C life easier, faster, smoother and more productive; maybe there's something here for you!



**If you're using Tamiya or Kyosho's hard plastic parts, don't use CA or thread-lockers that contain CA. Instead, try some Kyosho or Tamiya screw cement or a dab of Shoe Goo or Pactiva paint.**

### CRAZY GLUE MAKES PLASTIC GO CRAZY!

When I was racing with the Tamiya crowd this past summer, I noticed that a lot of racers, particularly novices, carried CA or Crazy Glue in their toolboxes. They thought it was great stuff (especially the gel type) for repairing torn-off tire chunks, and it was the first thing that they reached for when they didn't have the spare parts to fix a plastic chassis or a suspension part. I've seen the resulting mess often enough to feel the need to issue this warning: don't use CA on hard plastics!

Many CAs, which include several thread-locking products, don't react well with the hard plastics used in Tamiya kits. CA can make the plastic crack and reduce it to fragments around the screw hole or the place where the breakage occurred. I ruined a brand-new Bull Head chassis by using a CA-based thread-locking product on the nuts that held the suspension balls to the inside of the chassis tub. The next morning, the tub bottom was full of cracks that ran from hole to hole. I was bummed, and a new chassis wasn't cheap!

I should have used Tamiya or Kyosho\* screw cement. These non-CA products work well with their plastics (especially hard plastics). As an alternative, try a dab of Shoe Goo\*, Pactiva\* polycarbonate paint, or RTV\*. They do the job just as well, and there's no adverse reaction!

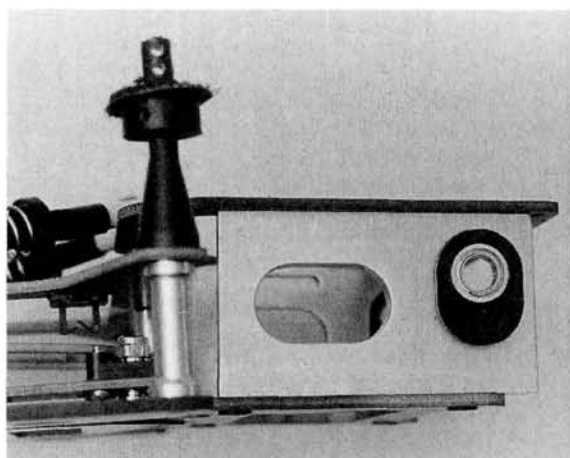
### YOKOMO EXTRAORDINAIRE

I really love Yokomo's YRX-10 on-road pan car. This marvel is a real scrapper right out of the box, and it requires little in the way of aftermarket parts to make it competitive on any level. One thing that's missing from the original kit, however, is a way to adjust rear ride height and to compensate for different tire sizes. I may start the day with a 62mm rear tire, which is the optimum height for the non-adjustable rear pod that comes on the car, but, by the third heat, the tire may be down to 60mm. I don't want to throw away a perfectly good set of tires, especially if the car is running the way I want it to, but with the kit's side plates, you don't have much choice.

I enlisted the help of master machinist Kevin Byrne, who made me a set of rear-pod side plates that accepted Associated-style ride-height adjusters. Associated\*, Trinity\*, Bolink\* and Yokomo cars all use the

same size rear bearing, so finding adjusters that fit was no problem. We carefully measured the available space on the kit's side plates, hoping that a relief could be machined into them, but there wasn't enough metal surrounding the bearing socket for the adjusters.

To allow enough "meat" around the adjusters, these new side plates are a little longer than the originals. That's fine with me, because the additional  $\frac{3}{16}$  inch or so gives me a little more leeway when I use larger spur gears and pinions. You can have a set of these made for you, too. Just look in the Yellow Pages under "Machine Shops," and take your original plates with you when you visit the machinist. Sometimes, if you ask around at your track, you can find someone like Kevin—a talented machinist who also races.



**The original YRX-10 side plates for the rear pod don't come with rear ride-height adjusters. Try to find a local machinist who will make a set for you at a reasonable price. The new side plates you see here allow me to keep the rear ride height constant, even when the tires wear and get smaller.**



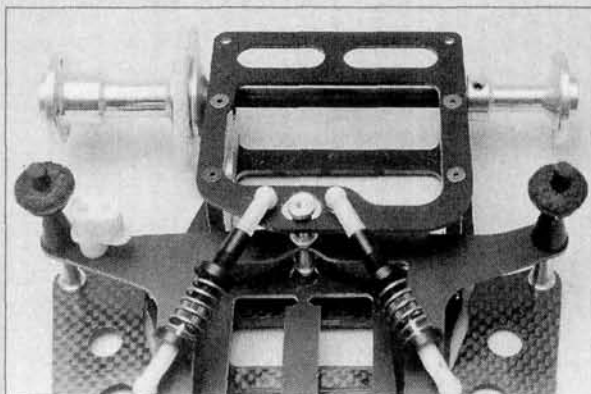
## WIDE OR NARROW? YOU BE THE JUDGE

I was talking to Dave Irrgang from IRS\* (this company makes some great differential pieces), and he told me that, in Europe, where 1/10-scale pan-car racing is very popular, people think that the Yokomo YRX-10 has a little too much rear traction. To solve this problem, they use a rear axle and hub combination that's slightly narrower than the one that comes with the car.

By swapping the kit's graphite rear axle and hubs for standard RC10L hubs and an axle, you can cut the rear track by about 3/8 inch and still use full-width rear tires. This way, you'll get the extra steer-

ing you need without resorting to narrower rear tires, harder tire compounds, or stiffer rear suspension—all of which can be bad if you're juggling the optimum handling setup.

The IRS setup shown here features a full-width 10L axle, a double-clamping left hub that eliminates having to file a flat on the axle, a lightweight right diff hub and diff rings that are retained by rubber O-rings instead of pins. The O-rings also cushion any impacts while racing, and they make the diff balls last a lot longer. It's smooth!



**The original YRX-10 hubs have a rear track of about 6.25 inches. That's great if you need a lot of traction and if you like your car to push a little.**

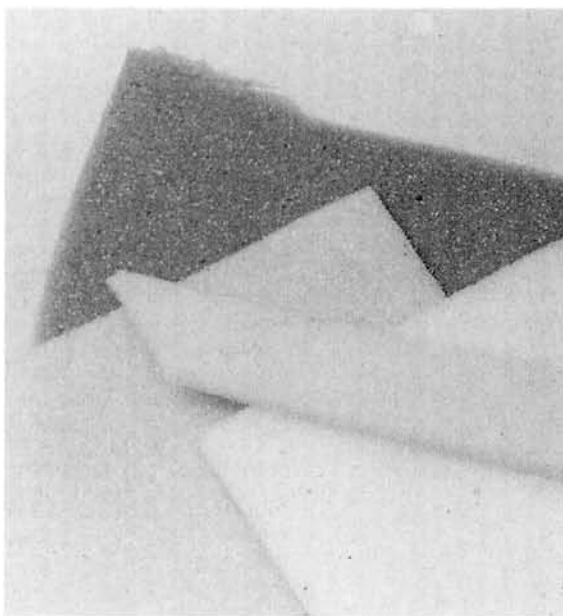
## CHEAPO TIRE LINERS

If you run off-road or in the popular sedan classes, you know that the new breed of soft-compound rubber tires requires a foam tire liner to be installed before the tires are glued to the rims. The liner keeps the tire from collapsing during use and presses the entire width of the tire's tread against the surface while you're cornering. Most of the off-road designs and many of the sedan tires come with foam liners. Are they the right ones for you and your driving style? What do you do if the new sedan tires you just bought don't come with liners?

If you're interested in experimenting with tire-liner density and stiffness, you can do it pretty inexpensively. Carpet padding, which is available in an amazing array of thicknesses and densities, does the job very well. I just watch the neighborhood as I drive through on my way to and from work. When I see a carpet-installation truck (the big rolls of carpet and padding are a dead giveaway), I ask the installers for a scrap or two of leftover padding. I've never had to pay for a piece of foam, and my collection includes everything from very thin, very dense stuff to thicker, more cloud-like padding. Stay away from padding

that's made of chopped-up pieces of scrap foam; the density is inconsistent.

Cut and measure your liners to fit the application, or use liners from another set of tires as a guide (make sure all the tires are the same size). Stuff the liners into the tires, and check out how they feel before you glue the tires to the rims. To determine whether I've made the right choice, before I glue the tires to the rims, I run a lap or two with my tires unglued.



**These foam pieces are scraps that a carpet-installation crew gave me. Now I can try different foam densities without having to run to the hobby shop!**

## FORMULA-1 TIRE-O-RAMA

I love to race my Formula-1 cars; it's probably my favorite class. It can be difficult, however, to find foam tires that are the right size and compound. I've used 1/12-scale tires for years, but they're really too small when they've been mounted—even when they're new and carefully trued. Now there's an answer for those who race in this class: pre-mounted and trued foam tires in just about any compound you could want!

Both TRC\* and Jaco\* now sell pre-trued tire and rim combos that fit Tamiya F1 and Indy cars. Tire compounds are available in pink, white, purple, green and blue. They just slide right on, and they're sized so that the fronts and rears will give you the proper ride height when they're used together. I've been testing them for a couple of weeks, and they're just as true and long-lasting as the tires that I mount and true on my own machine.



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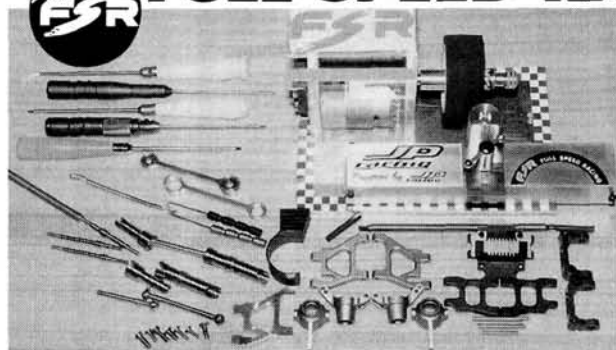
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Mfr. of fine R/C products using our own CNC machines. Tamiya TAO2 aluminum modified parts, wheels. Titanium tie-rod, dogbone, screws, transmission shaft, wheel shaft. Tire cutting machine, Tire gluing machine, Tire, Chassis, Bodies, Allen wrench, Silicone oil, Oil filter, Modified engines, Engine mount, Fuel, Tuned pipe, and many others.



**R/C DOCTOR**

### HPI FRONT-END FIXER-UPPER

I really love HPI's\* articulated-arm, front-end designs. Their F1 and on-road suspension systems give you a lot of adjustments, including caster, camber, spring rate and a choice of in-line or trailing-axle setups—so many choices! The designs aren't perfect, however, as the company discovered shortly after releasing their fabulous Super Graphite F1 kit.

The front ends on these cars have a lot of steering, and they have a respectable amount of front-end travel. In an effort to reduce steering response, many drivers followed the kit's directions and installed a pair of black O-rings instead of springs on the front joint pins. This reduced travel and response, but it also meant that most of the suspension's reaction to bumps and imperfections came from suspension-arm deflection—not a good thing, because you can't damp or regulate a nylon arm that's bending up and down.

To cure this, HPI has come out with an alternative joint pin that allows you to install springs on the front end again. Springs of various thicknesses are also available as tuning aids, along with a red, rubber O-ring that provides damping as it grips the joint pin and slows the front end's reaction time. The result is more front-end travel that's regulated by the spring and controlled by the O-ring—simple and effective!

Three joint pins are now available: the original short one comes with the F1 front suspension; the medium length piece is part of the Street Machine/Roadstar design; and a new, longer aluminum pin is an aftermarket piece. If you're careful about spring preload and ride height, you'll even be able to install longer springs that provide added suspension travel, e.g., Associated, BRP\* and Wolfe\* springs, along with an O-ring. A few words of caution: before you take your car to the track, check the clearance between the bottom of the joint pin and the racing surface. Some spring and joint-pin combinations may cause the E-clip that holds the spring and washer on the pin to snag on the carpet or pavement. This will cause teeny little parts to scatter to the four winds and the front end to hit the ground. Not a pretty sight! For that reason, I discourage the use of the longest pin with the F1 suspension. The medium-length pin should do the trick.

\*Addresses are listed alphabetically in the Index of Manufacturers on page 264.





## GETTING STARTED

by Brian Leslie

# Learning the Basics

**T**HERE ARE approximately 46 bazillion makes and models of R/C vehicles—give or take a few. So how do you know which one is right for you? The decision-making process that leads to your first R/C purchase can be dizzying. Before you can make a sound choice, many questions need to be answered, such as: should I buy a car or truck?—and, if a truck, should it be a stadium racer or a monster truck? Should I get an on-road pan car or a 4WD sedan? Who knows?

Here are some basic guidelines to help you.

## GAS OR ELECTRIC?

If this is your first R/C vehicle, I recommend electric rather than nitro power. Electric cars and trucks are generally cleaner, quieter and easier to start with. Electric is the most commonly used R/C power in the U.S., so getting help and buying replacement and hop-up items is pretty easy.

If racing is in your future then, again, electric-powered cars may be your best bet because during the winter months, they can be run indoors.

There's an unbelievable number of motors available, so you can choose one that matches your skill level. As you improve, you can upgrade. Gas vehicles don't really lend themselves to a learning curve; they're very fast right out of the box, and there's no really easy way to tone them down.



## WHICH MANUFACTURER?

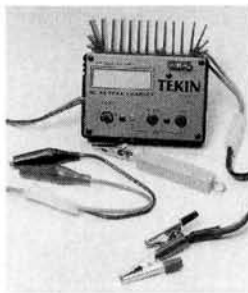
For cars, motors, batteries, radios and anything else you need, you'll usually do well by sticking with well-known manufacturers. Companies such as Tamiya\*, Kyosho\*, Associated\*, Trinity\*, Losi\* and Traxxas\* all have proven track records and go out of their way to support their products and the R/C industry. It is important to purchase a vehicle that is supported by its manufacturer and by your local hobby shop. It's no fun ordering parts and waiting weeks for the delivery because the part had to be back-ordered. When you need help or want hop-up parts, consult an expert.

• **Which motor?** Your first motor should be a stock motor, which will provide all the speed and power you could want (at least, for now). If the kit you bought doesn't include one, you can pick one up for around \$25. After you have mastered the stock motor, if you feel you need more power, look into buying a modified motor—much faster!



• **Batteries?** There are a million kinds of batteries on the market. To start, I strongly suggest that you use 1400 to 1800mAh SCR sport-type packs. Expect to spend about \$15 to \$20 for a sport pack.

• **Charger?** If you want to spend a little extra, this is where to do it. Any 15-minute, timer-type charger will work, but peak-detect-type chargers work best because they peak the battery pack at its full charge then shut off automatically to prevent overcharging. With these chargers, all the guesswork is eliminated, so you never have to wonder whether your packs are fully charged. Timer-type chargers work well but require guesswork and risk



overcharging—a big no-no. Peak-detect-type chargers are worth the extra money. Check the December 1995 issue of *Car Action* for a comprehensive guide to all the chargers currently on the market.

• **Radios?** I recommend that you start with an AM pistol-grip radio system. There are many good, inexpensive units on the market. The only feature that you should look for in your first radio is servo-reversing capability. You'll find good entry-level radio systems in the \$50 to \$100 range. There are even some entry-level radios that have a servo/ESC combo available instead of the standard two-servo setup. For a better look at entry-level radio systems, check out *Car Action's* "Budget Radio Guide" in the November 1995 issue.

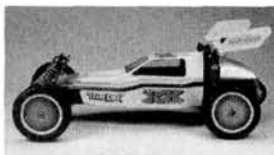


• **Servos?** Certain vehicles have certain steering servo requirements. Monster trucks require servos that provide more



## CAR OR TRUCK? ON OR OFF-ROAD? 2WD OR 4WD?

To start, I recommend off-road vehicles because they're versatile. Just change to on-road-type tires, and you can run on any pavement, cement or carpet surfaces. Most on-road cars should be run on smooth surfaces such as cement and asphalt, and they don't perform well on dirt. Also, off-road buggies and trucks are designed for the rough-and-tumble world of off-road driving—perfect for



beginners. Believe me, if there is an obstacle to hit, you'll hit it. The speed that these cars deliver is definitely fast enough to do lots of damage, so ruggedness is key.

If I had to choose between a buggy or truck, I'd choose a truck because it's a little heavier and wider and is equipped with bigger wheels. These factors make R/C trucks (especially stadium-type trucks) easy and fun to drive. Because they have a wide stance and a long

wheelbase, they're less likely to spin out and are best-suited to rough terrain and sandy areas with large jumps. They can literally run over anything that gets in their way—including other R/C cars!

The design of 4WD vehicles is pretty complex. Learn how to build and drive 2WD first, then join the seasoned RC'ers in 4WD.



torque than speed. Racing trucks require both torque and speed. 2WD buggies work best with a servo that provides a moderate amount of torque and speed, and on-road pan cars need more speed than torque. You're always better off buying a servo (within your budget) that has a combination of both high torque and fast transit speeds. Cars that don't require more torque can easily use the servo that comes with the radio system until you need to upgrade to a better servo.

• **Electronic speed control.** This is one of the biggest, most important upgrades that you can make to electric-powered R/C vehicles. Many beginner R/C kits come with mechanical speed controls. Though some of these work well, they tend to be inefficient and unreliable. Do yourself a favor, and get a sport-type ESC as soon as possible. ESCs increase run times, deliver silky-smooth throttle and brake control and are nearly 100-percent reliable. If you

ever plan to race, be sure to purchase an ESC without reverse; only forward and brake are allowed in competition. A good sport ESC should cost you in the neighborhood of \$60.

Purchasing the correct equipment up front can make a big difference to how much fun you have in the future. Hard-to-find parts and shoddy equipment can very quickly turn a person sour on R/C.

Talk to people who are already involved with the sport. Read *R/C Car Action*. If you're into racing, pay attention to the cars and trucks that win at big events. After a while, you'll see a trend: the same types, makes and models keep cropping up. There's a reason for this! It shows that the equipment is among the top in its field. If you do some homework now, you won't be sorry later.



\* Addresses are listed alphabetically in the Index of Manufacturers on page 264.



## Clod-A-Leaver II Wins 1995 NR/CTPA World Championship

**J**oe Kirkwood won the 1995 World's driving a Clod-A-Leaver II-equipped Clod Buster. Other special parts used included a Tekin 420-62 speed control, PTI batteries, Trinity Kinwald motors and Thorp ball diffs.

The same chassis/suspension/steering kit is available to you and gives much better handling, much better steering, superb high-speed stability and tremendous durability for high-speed racing or just having a great time.

The kit fits both Clod Buster and Bullhead vehicles. Included in the kit are the light-weight chassis, battery tray, receiver and speed-control tray, long-wheelbase stainless ladder bars, heavy-duty 6-32 ball ends, axle-mounted steering-servo bracket/brush guard assembly, stainless-steel tie rods, full cantilever shock-mounting system and front and rear sway bars. All of these things are standard equipment on every **Clod-A-Leaver II** (note: cantilever shock-mounting and sway bars have been standard on **Clod-A-Leavers** since they became available in 1992). If you don't have a Clod Buster and would like to build one up from parts, you will need the following: the **Clod-A-Leaver II** Kit, two complete Clod Buster axle/gearbox assemblies, shocks, motors, all electronics, body, body mounts, wheels and tires. These parts are all available new from **Bennett Equipment**, or we also have a good selection of used parts at a 30 to 50% savings. We also have available rolling chassis or complete vehicles with the **Clod-A-Leaver II** Kit installed. We also have in stock motors, custom wheels and most other special parts for Clods as well as the stock Tamiya parts. The suggested 2-wheel-steering version of the **Clod-A-Leaver II** is \$225 and the 4-wheel-steering version is \$250 (both are 4-wheel drive).

The **Clod-A-Leaver Jr.** is a new chassis kit available for those on a budget or as an entry-level vehicle. This kit can be upgraded at any time to the full **Clod-A-Leaver II** specifications. The kit features the same light-weight (8 1/4 oz.) chassis, the same long wheelbase, stainless-steel ladder bars and the same heavy-duty 6-32 ball ends. The kit also includes extended steering rods and a relocated steering-servo mount. This kit will greatly improve handling and durability of the stock Clod Buster or Bullhead. The **Clod-A-Leaver Jr.** sells for \$129. The upgrades to bring it up to **Clod-A-Leaver II** specifications are: the steering kit with brush guard for \$32 (two required for 4-wheel steering), the sway-bar kit for \$40 and the full cantilever shock-mounting brackets for \$50.

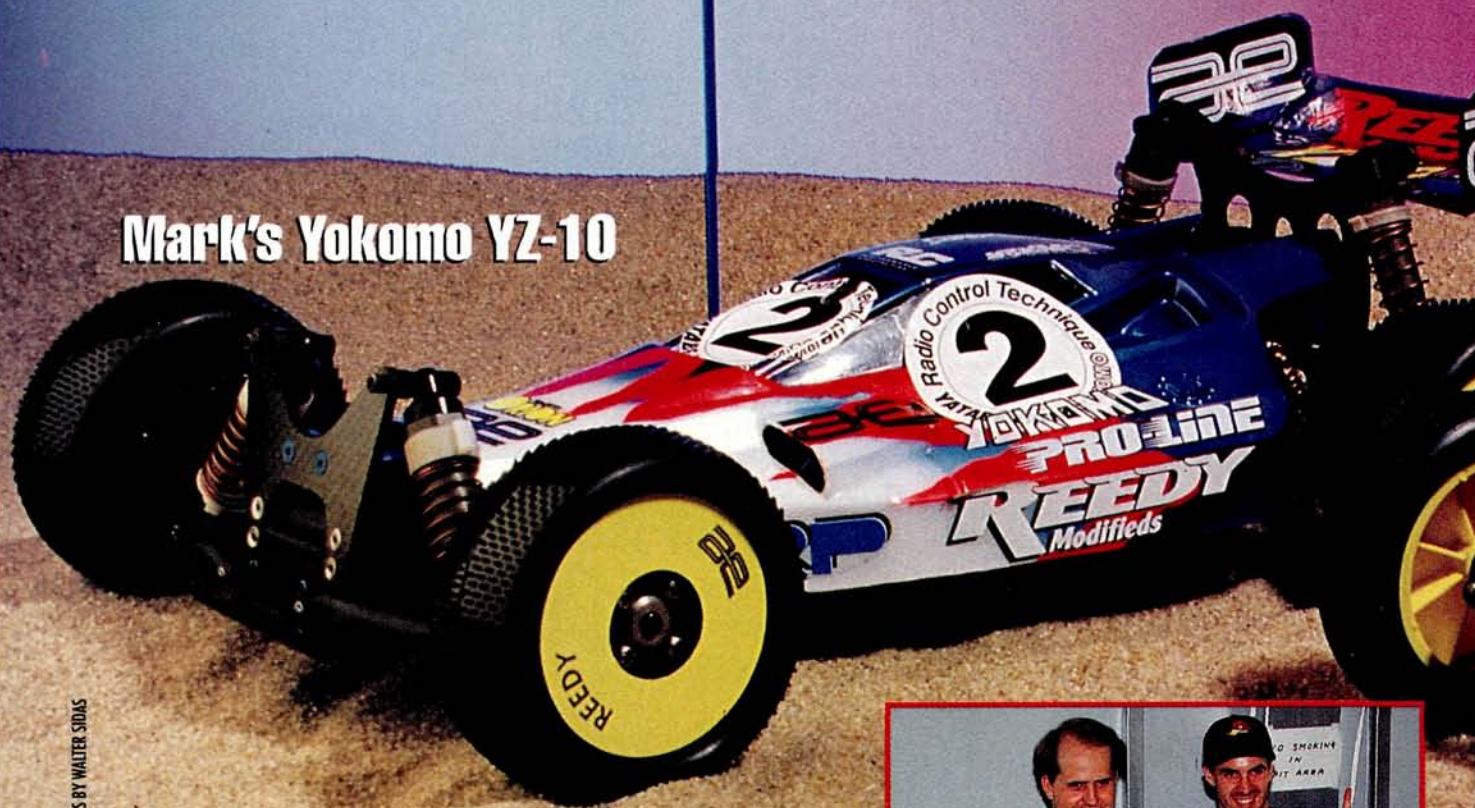
### Bennett Equipment

900 East 1300 South, Romney, IN 47981  
(317) 538-2725 (eve.)

**SEND \$2.00 FOR BROCHURE**



Mark's Yokomo YZ-10



PHOTOS BY WALTER SIDAIS



Number-one guys! Mark Pavidis (left)—4WD world champ; Matt Francis—2WD world champ.

# Inside the WORLD CHAMPS' Winning Cars

by GEORGE M. GONZALEZ





**Matt's Associated RC10B2**

## *Matt and Mark reveal their winning setups*

**M**ANY PEOPLE refer to R/C racing as a "hobby," but if you ever went to a world championship race, you'd immediately notice that the racers aren't exactly *relaxing*. Winning a world championship takes time, patience, concentration and the ability to drive under the most adverse conditions. Being able to dial-in a car precisely is probably the most important skill needed to win a race—besides driving skill, of course. Trick racing parts—ones that aren't usually available to the

public—are often used to give racers an edge against their competition. Both Matt Francis and Mark Pavidis managed to come up with the perfect combination of dialed-in car and superb skill, and they should be recognized as masters of their trade.

If you're curious about how these two R/C warriors set up their cars to take on the Worlds in Japan, read on. Who knows? Maybe you, too, can become an R/C samurai!

## **WIN** a Worlds T-shirt— Autographed by the winners!

**H**ere's your chance to win a really cool '95 Worlds T-shirt. But wait.... These aren't your basic change the oil in your car, clean out your basement, wipe the floor with them T-shirts. We're talking official, custom, silk-screened, '95 IFMAR World Championship T-shirts that were available only in Japan during the Worlds. Every T-shirt has been autographed by Matt Francis and Mark Pavidis, and there are *only five* of them in the U.S. Of course, we have all five, and they're locked up safely in the Car Action vault.

### **The Rules**

Design your own World Championship dream track with all the twists, turns, bumps and jumps that you'd want to tame. Get it down on paper, and send us your illustration. That's it! What could be easier? Your layout drawing can be drafted by hand or computer-generated; but keep in mind that we aren't after the *best-looking* illustration, we're looking for the *best track layout*.

Make your illustration as detailed as possible, and please include your name, address and phone number on each one that you submit. We will publish the five winning layouts, so start drafting.

All entries must be postmarked by January 5, 1996.

Send your entries to:

### **T-Shirt Contest**

Radio Control Car Action

251 Danbury Rd., Wilton, CT 06897 41





# Matt's Associated RC10B2

*The Team Shocks have MIP Golden shock shafts, Associated Green springs, Lunsford Punisher titanium turnbuckles and Losi Silver ribs. An Airtronics 94151 servo provides the lightning-fast steering, while a set of Reedy/Orion cells provide the juice. Matt altered the suspension geometry by installing three spacers on the steering blocks under the ball joints.*



*The chassis and suspension components on Matt's car are molded out of a light, rigid, carbon-fiber/nylon material.*



*The Team Shocks are outfitted with Silver springs and MIP Golden shock shafts. MIP CVDs, Lunsford Punisher turnbuckles and Pro-Line Squared Fuzzies round out the rear end. A Reedy Sonic 10-turn double provides the "mondo" horsepower.*

## IN THE FRONT:

Matt used the standard 1.02 shock bodies with MIP .71 Golden shock shafts. He installed a set of number 1 shock pistons and used one travel-limiting spacer in each shock. He filled the shocks with 40WT shock fluid and used a set of Associated Green springs. Matt set up his front end with the standard 25-degree caster blocks and, on the steering blocks, he installed three steering spacers that altered the geometry considerably; according to Matt, this makes the car push slightly, which, in turn, makes the car more forgiving when it exits turns. Matt mounted the front shocks in the inside shock-mounting hole of the front shock tower and in the inside shock-mounting hole of the suspension arms. In addition, he set up his car with 1 degree of toe-in.

Matt found Pro-Line's\* new Squared Fuzzies to be the hot ticket for the rear end, and a set of Team Losi\* Full-Radius Ribbed front tires balanced the traction superbly. He used foam inserts on the rears, but left them out of the Losi fronts. He also used a complete set of Lunsford's\* indestructible Punisher titanium tie rods.

As for electronics, Matt used a potent Reedy\* Sonic 10-turn double modified motor and six Orion/Reedy 1700 SCRC Sanyo cells. LRP's\* new ICS Digital speed control handled the heavy horsepower, while an Airtronics\* Caliber 3Ps and 94151 servo kept his car on the right track. Matt geared his car with a 17/84 pinion-to-spur combination and found this to be the best compromise between top speed and out-of-the-corner punch.

## IN THE REAR:

Matt used standard Associated\* 1.32 shock bodies and MIP\* 1.02 Golden shock shafts. He used one travel-limiting shim on the inside of each shock shaft, and he installed a set of number 1 shock pistons.

He filled the shocks with Associated 25WT shock fluid and used the kit's stock Silver springs. He kept the camber links in the recommended positions, and he set up his car with 1 degree of negative camber. Matt chose to run 3 degrees of rear toe-in and 3 degrees of anti-squat, and he installed a set of MIP CVDs, which he swears by.



# Mark's Yokomo YZ-10



**IN THE FRONT:** Mark installed a set of Associated 1.02 Team Shocks, and he outfitted them with number 1 shock pistons, 40WT oil and a set of Yokomo Copper springs. The car has 1 degree of negative camber and 0 degrees of toe-in, and the camber links and shock bodies are in their stock positions. A set of Pro-Line Squared Fuzzies with foam inserts were narrowed to fit the front wheels.

Up front, Mark used a set of Associated 1.02-stroke Team Shocks with Yokomo Copper springs, Lunsford Punisher titanium turnbuckles and narrowed-down Pro-Line Squared Fuzzies. An Airtronics 94151 servo provides the steering while an LRP ICS Digital ESC manages the power.



Mark's YZ-10 was outfitted with Yokomo's\* all-new, prototype, graphite chassis, which was designed for the bumpy terrain at the Yatabe Arena. The new chassis features an improved battery position—closer to the chassis' center line. In addition, new graphite shock towers and battery braces reduce weight and increase strength.

Mark used a Reedy Sonic 10-turn modified motor, Orion/Reedy 1700 SCRC Sanyo cells and an LRP ICS Digital electronic speed control. He found a 17/87 pinion-to-spur-gear combination perfect for the high-speed Yatabe Arena track. His "lucky" Airtronics CS-2P transmitter and 94151 high-speed servo allowed him to slice through traffic with surgeon-like precision.



Yokomo's prototype graphite chassis and suspension components, Associated 1.32-stroke Team Shocks with Yokomo Copper springs and Pro-Line's new Squared Fuzzies round off the rear end of Mark's YZ-10.



Pro-Line's Squared Fuzzies were cut down to fit the YZ-10's narrow front wheels. Mark did such a fine job that it looks as if the tire has been made this way.

## IN THE REAR:

You'll find a pair of Associated 1.32 Team Shocks with number 1 shock pistons, 35WT oil and Yokomo Copper springs. Mark set up the car with 1 degree of negative camber, 3 degrees of toe-in and 1.5 degrees of anti-squat. He installed the shock bodies in the middle mounting hole on the shock tower and outside mounting hole on the A-arms. The camber links remained in their stock positions (inside mounting hole on the rear bulkhead). A pair of Pro-Line Squared Fuzzies with foam inserts finished off the rears.

\* Addresses are listed alphabetically in the Index of Manufacturers on page 264. ■





## SPECIFICATIONS

**SCALE** .....1/10  
**LIST PRICE** .....\$236

### DIMENSIONS

Overall length .....16.5 in.  
Wheelbase .....10.25 in.  
Width (F/R) .....7.25 in.

**WEIGHT** (gross, RTR) .....3 lb., 5 oz.

### CHASSIS

Type .....Molded tub  
Material .....Plastic

### DRIVE TRAIN

Type .....Sealed gear drive  
Primary .....Pinion/spur  
Transmission .....Gear  
Differential .....Ball diff

Slipper clutch .....None  
Bearings/bushings .....Plastic  
and metal bushings

### SUSPENSION (F/R)

Type ..4W independent, lower A-arms  
Damping .....Oil-filled,  
coil-over plastic shocks

### WHEELS (F/R)

Type .....One-piece plastic  
Dimensions (DxW) .....2x1 in.

**TIRES** (F/R) .....Semi-pneumatic,  
"realistic," off-road

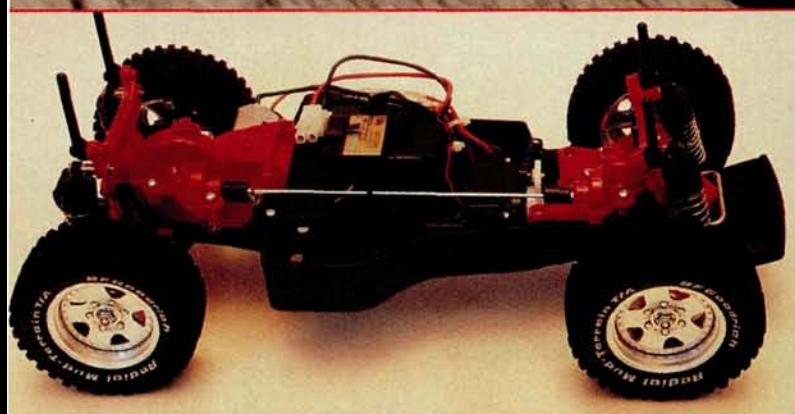
### ELECTRICS

Motor .....540 stock  
Battery .....Not included  
Speed control .....3-step mechanical

## Things You'll Need

- 2-channel radio system
- Battery pack
- Battery charger
- Needle-nose pliers
  - No. 1 and no. 2 Phillips screwdrivers
  - Nail clippers (for trimming plastic pieces off parts trees)
  - Lexan scissors

# Off-Road THUNDER



The S-10 truck is essentially a touring car with large tires. As such, its track—or overall width—is rather narrow, and that makes it look like a 1/12-scale vehicle next to stablemates such as the Toyota Hi-Lux and the Nissan King Cab.

## Factory Options

- Universal shaft set—53115
- Hard-joint cup set—53118
- 4WD bushing and ball connector set—53144
- Short, hard, propeller shaft—53152
- Ball-bearing set—53073



# Tamiya Chevy S-10

by JEFF BARTLETT

**T**HUNDER SHOOK Tamiya's\* walls as the Chevy S-10 4WD truck rolled out of the laboratory and into hobby stores. Over the past year, Tamiya's vehicles have become increasingly realistic. Gone are the days when buggies such as the Frog and the Hornet ruled neighborhoods. Today, R/C rebels can choose from a variety of Formula 1 cars, European touring sedans, high-performance Japanese cars and trucks such as this one.

## KIT FEATURES

The kit contains fasteners that are packed in clearly labeled bags, a detailed instruction manual complete with exploded-view diagrams, standard box and hex wrenches, diff lube, grease, a Mabuchi 540 motor and a 3-step mechanical speed control.

Many novices are afraid of complex transmissions, which, no doubt, scares many of them away from 4WD kits. The S-10's full-time, steel, shaft-driven, 4WD transmission assembly, however, is quite simple. The front planetary diff and the rear ball diff are housed in sealed gearboxes, which are equipped with quick-release hatches for easy maintenance.

Unlike some kits that require "fiddling" to properly align the pinion gear with the spur gear, the S-10 includes a spacer to ensure proper offset. The plastic motor mount has a ring of numbered holes, which are used according to the number of teeth on the pinion gear. I was skeptical about how well I had screwed the motor and mount into place because I couldn't see them. When I had completed the kit and fired up the truck, however, the fit proved to be dead-on.

The S-10 features independent, double-wishbone suspension. All four, oil-filled,

coil-over shocks are built and installed at the same time. Tamiya's shocks are always easy to assemble, and they're leak-free. The kit also includes assorted pistons and ride-height spacers.

The one-piece Lexan body is covered with a protective vinyl coating to keep the body free from overspray when you paint it. The kit includes handy window masks that must be cut out; they're much easier to use than masking tape! A complete decal set is included, so the patient modeler can replicate the paint and sticker scheme of the full-size truck—even the distinctive lightning streak. The decals are mounted on clear, adhesive film. The kit includes semi-pneumatic, all-terrain, synthetic-rubber tires. Also included is a set of true-to-scale wheels with an aluminum finish.

## TEST GEAR

Before I even had the truck, I had a radio system ready and waiting. Because this truck was destined for backyard bashing and parking-lot fun, I wanted radio gear that was simple to install and easy to use. An Airtronics\* Rival RV2P radio, 92721 2-channel receiver and 94102 servo fit the bill at a reasonable price. Because I'm not a fan of the standard mechanical speed control, I used the Airtronics Contender ESC. Current was provided by a Parma\* 6-cell 1700mAh pack.

## PERFORMANCE

After having spent eight hours assembling the truck and another four detailing the body, I was ready to drive. With a couple of 1700mAh SCR battery packs in hand, I headed to the neighborhood BMX track. With just a turn of the Rival's dials, I was all set.

**The kit contains 16 plastic bushings and six metal bushings. Because of the added friction caused by a second differential, you should install a set of ball bearings. I used Tamiya's 53073 Manta Ray Ball Bearing Set, which is recommended for Tamiya's line of touring cars that use the same chassis.**



## THE REAL THING

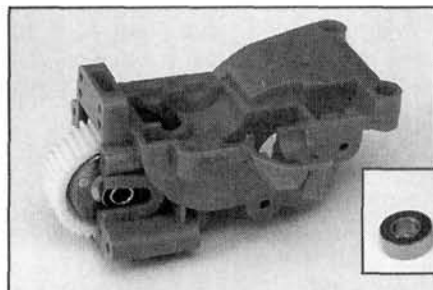
Tamiya's S-10 is based on the full-size off-road race trucks run by Nelson & Nelson Racing (N&N). The paint-and-decal schemes resemble those of the winning N&N trucks that are driven by Larry Ragland (through the desert) and Rick Johnson (in stadiums). These trucks are so heavily modified for their specific racing styles that only the bodies resemble the production versions. The N&N Class-8 desert racer, which I think the Tamiya truck most closely resembles, is built to withstand 500 miles or more of full-bore racing across open desert, diving into large depressions and taking flight over sandy rises. A 630hp engine and a whopping 23 inches of suspension travel are key ingredients.

## likes

- Straightforward assembly.
- Well-engineered kit.
- Protective vinyl coating on body to protect from overspray.
- Fills market niche between on-road and off-road vehicles.
- Very realistic looks, right down to the tires and wheels.

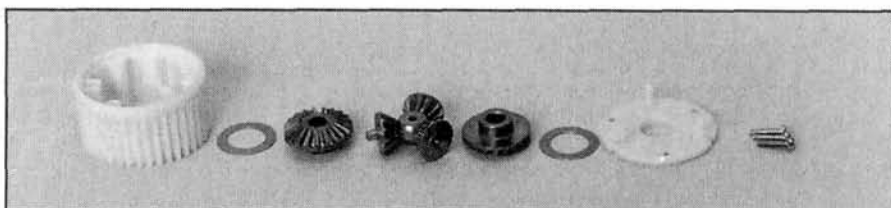
## dislikes

- Narrow track and low clearance for a truck.
- Too many plastic bushings, many of which would be difficult to replace later with bearings.





I drove the truck around the parking lot. At first, I just stuck to a basic square pattern so that I could check wheel alignment and steering response. When no problems had arisen after a few laps, I performed some figure-8s and just messed around. The truck was faster than I had expected it to be on pavement (probably owing to the bearings). The suspension was a little soft for hard turning, and that allowed a bit of body roll, but it was tight enough to keep all four wheels planted. Handling is a notch looser than the handling on the sedan versions that use the same chassis and feel as if they're on rails. Before I knew it, 15 minutes had passed, and the battery had died.



**When you assemble the two differentials, line up the pieces as shown in the instructions. Sometimes you can't put down the half-assembled diff without the pieces becoming misaligned, so stack them one right after the other. This also ensures that you use the proper components.**

Slapping in the second battery, I walked over to the dirt track that the neighborhood kids had built on an open lot. After a few sliding turns through the fine dirt, I knew that the truck would never be as clean as it had been a half hour before. In the dirt, the handling was predictable and steady.

I moved to the series of jumps that the local kids love to show off on, and I lined the truck up for a run through the moguls. The truck leaped gracefully off the first two smaller jumps, but the larger jumps were a challenge. The truck's narrow track isn't very forgiving on less-than-perfect landings, which is similar to the Blackfoot's handling, but not as bad. Fortunately, the low center of gravity helps to keep the top up.

## Building and Setup Tips

- The instructions call for the installation of 16 plastic and six metal bushings—most of which go in the gearboxes. With all these bushings, the drive train is bound to have considerable drag, so be sure to apply plenty of grease to all the bushings. Because I didn't want to have to tear the units apart later, I installed a complete set of ball bearings during assembly.

- The exploded view of the rear differential shown in step 1 would send chills up most people's backs; however, if the pieces have been laid out as shown, the assembly is quite simple. I usually put the parts on a paper towel because the texture prevents the small diff balls from rolling away, and it makes the small parts easier to see. Be sure to apply plenty of diff grease where the instructions indicate, and apply grease liberally to all the gears.

- Step 7 shows how to install the rear gearbox joints; don't install them backward—a common mistake. The longer joint that's used in this step is identical to the one used in step 1 for assembling

the front differential. Although the instructions don't call for it, in steps 8 and 9, I added grease to the rods on which the A-arms pivot. I thought that friction should be minimized on all the moving parts.

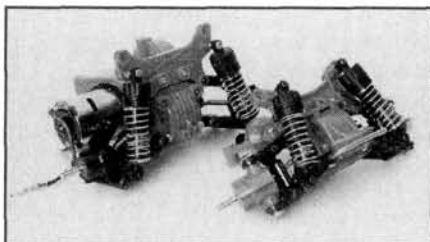
- When you thread the ball socket onto the shock shafts, don't touch the metal shafts with pliers. If you scratch the shock shaft, it will catch on the rubber O-rings and affect shock performance. To protect the shaft, wrap the rod in paper towels or affix a couple of pieces of servo tape to the pliers.

- The radio installation couldn't have been easier. The receiver is secured to the radio tray with servo tape, and the ESC is mounted vertically right in front of it. Although the stock servo-saver effectively protects your servo, I used a large Kimbrough\* servo-saver for additional protection.

- In preparation for painting, the body should be cleaned with soapy water and dried with paper towels to remove unwanted dirt and fingerprints. The darkest colors should be painted on first, so I

began by painting the tailgate and bed using Pactra's\* Outlaw Black spray paint. Next, I painted the hood and the front fenders in Blue Streak. The grill was easy to spray paint because the kit includes decals for the head lamps and the black spaces between the grill slats; otherwise, I would have had to use a paint brush or a paint marker. When these pieces had dried, I sprayed a couple coats of Sprint White on the underside. Painting the white behind the colors enriches the paint and prevents light from shining through any thin spots.

After I had completed the painting, I removed the masking tape, the window mask and the protective vinyl coating. To apply the decals, cut them out, peel off the backing, and stick them on. This took me more than an hour to do because I was extremely careful to line up the stickers and prevent bubbles from forming. Many people recommend that you use soapy water on the body to help position the decals. When the soapy water has dried, the decals stick permanently.



**As with real cars, you build the sub-assemblies of the two transmissions before you fasten them to the chassis. This makes the kit easy to work with.**

## FINAL THOUGHTS

The batteries became drained, the truck got filthy, and I developed a wide smile. In jumping prowess, the S-10 poses no threat to purpose-built racing trucks, but it does fill a niche somewhere between Tamiya's touring sedans and ultra-realistic trucks, such as the new Jeep Wrangler. The S-10 is one of only a few American vehicles replicated in the R/C industry, which tends to build more European and Japanese vehicles. We asked Tamiya why they duplicate so few American vehicles, and they explained that they sell more cars in Europe and Japan than they do in the United States. There's also the sticky matter of licensing (the rights given by a company to use their name or logo).

For the average enthusiast, the S-10 offers a great alternative in an entry-level market that's becoming saturated with cars and race-oriented trucks.

*Chevrolet, Chevy, the Bow Tie emblem, the S-10 emblem and body design and Chevy Thunder are trademarks of the Chevrolet Motor Division, General Motors Corporation and used under license to Tamiya Inc.*

*\*Addresses are listed alphabetically in the Index of Manufacturers on page 264.*







## Tamiya Opel Calibra V6 DTM

by Stacey Granelli

**W**E ALL have to start somewhere. So, when several new kits arrived at the *Car Action* office, I decided it was time for me to build my first R/C car. I had been an R/C poser for some time—working on R/C articles for months without ever having assembled a car myself. I asked the editors which kit was beginner-proof, and they pointed to the Tamiya\* 1/10-scale Opel Calibra V6 DTM. It's a cool 4WD parking-lot pounder, and Tamiya kits are famous for having excellent instructions. The adventure began.

### KIT FEATURES

I got a little scared when I opened the box and saw all the parts bags, boxes and "bubble packs." Assembly would clearly take me more than the mere three hours that so many R/C'ers boast about. Luckily, the instruction manual couldn't have been clearer; it contained step-by-step instructions with full-size diagrams, and the multicolored, plastic-resin parts were clearly marked.

The Opel is based on the advanced TA02 chassis. This design has wider front suspension arms for more stability during high-speed maneuvering. The stiff, molded chassis doesn't twist during suspension operation, so it provides consistent handling. The motor, battery and gearbox are centered in the vehicle for optimum balance and weight distribution.

The 4WD transmission includes a rear ball diff and a front planetary-gear diff. The transmission gears are molded out of white-nylon, fiber-filled composite, so they should be pretty strong. The front and rear gearboxes are simple, efficient and easy to maintain, and they're connected by a metal drive shaft. To access them, you simply remove four screws.

The car features 4W independent suspension that consists of lower suspension arms and fixed upper links. Rounding out the suspension are four plastic, independent, oil-filled, coil-over shocks. They provide good handling over the bumpy stuff (you know—curbs, potholes and that occasional roller-blader).

*(Continued on page 54)*

## A Tale of

**I**t was the best of times for parking-lot racers; it was the worst of times for parking-lot racers (actually, it leaned more toward the best of times); it was the age of plastic chassis; it was the age of aluminum chassis; it was the epoch of oil-filled shocks; it was the epoch of coil springs; it was the season of shaft drive; it was the season of belt drive.... What the Dickens is going on here?



### TESTING

## TAMIYA'S OPEL CALIBRA V6 DTM

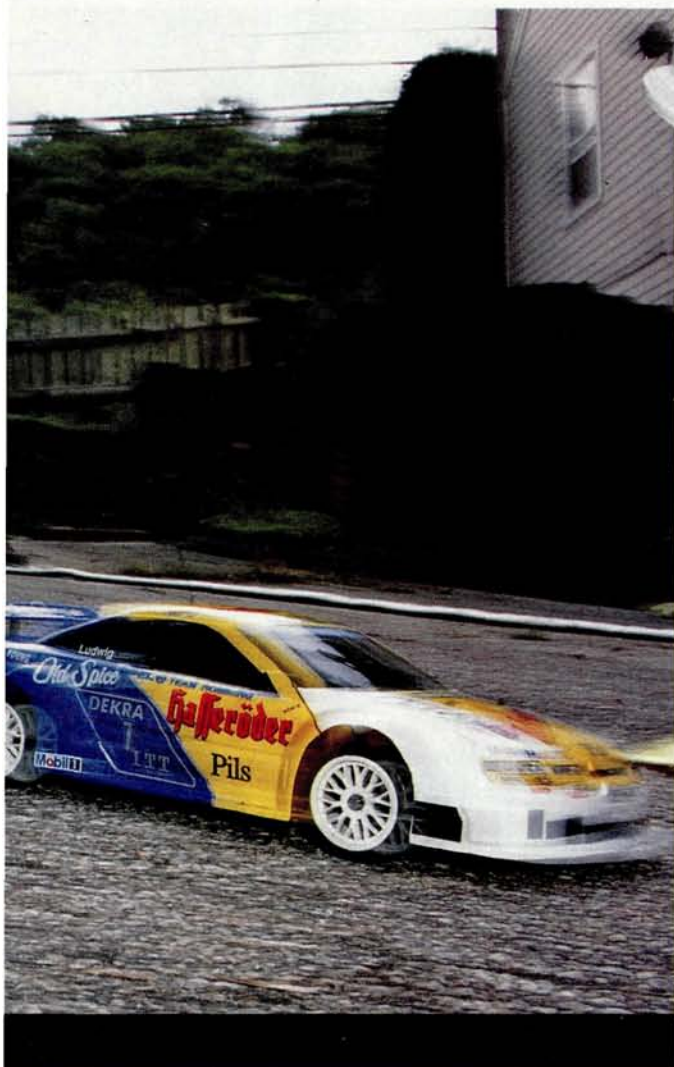
PHOTOS BY WALTER SIDAS





# Two Opels

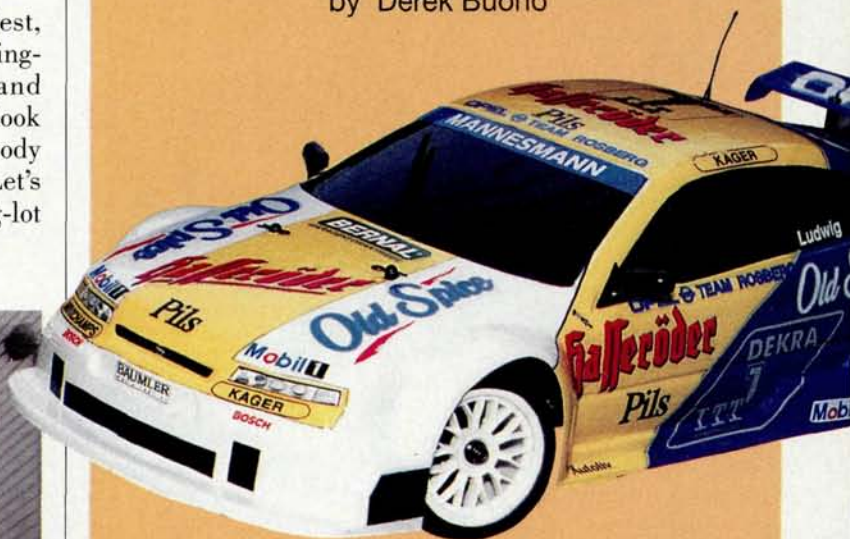
What you see before you are two of the hottest, newest Opels that are currently hitting the parking-lot scene—Tamiya's venerable TA02 (left) and Kyosho's newest endeavor, the TF-2. They may look similar on the outside, but underneath the Opel body shells are two completely different machines. Let's take a look at what each has to offer us parking-lot prowlers.



## KYOSHO'S OPEL CALIBRA V6

### Kyosho Opel Calibra V6

by Derek Buono



**K**YOSHO IS KNOWN for producing high-performance, competitively priced vehicles. The new Opel Calibra V6 is their latest venture into the ever-popular 4WD touring-car class. It's the first Kyosho\* product in the U.S. to use the new TF-2 4WD chassis—a narrow, belt-drive platform that can credit some of its design to Kyosho's popular Lazer off-road buggy. With this in mind, I had no doubts about the Calibra's performance capabilities, even before I opened the box!

#### KIT FEATURES

There are two versions of the TF-2 chassis: a sport model that is intended for budget-conscious racers; and a high-zoot competition model. I received the sport version for review.

The TF-2 chassis has an attractive, aluminum, strong double-deck design. A simple, two-belt transmission system transfers the power of the included RS-540 motor from a center shaft/pulley to front and rear gear differentials. Steel dogbones connect the drive system to two pairs of Kyosho's cool-looking, BBS-type wheels, which are shod with rubber slick tires.

The TF-2's drive system is completely open, but given the relatively clean surfaces on which touring cars are usually run, reliability shouldn't be a problem. In fact, I believe that a fully enclosed belt-drive system is actually more prone to being damaged by small pebbles and debris, which can be trapped inside a transmission case.

On all four corners, suspension is independent with non-adjustable upper links. I feel that non-adjustable upper links are better for beginner builders, who tend to have trouble setting up adjustable links to achieve the correct amount of wheel camber. The base-model TF-2 doesn't come with oil-filled shocks—somewhat disappointing. But coil-spring dampers are included instead; I'll reserve judgment on their

(Continued on page 55)





(Continued from page 52)

The kit also comes with an unpainted, polycarbonate body; a separately molded rear spoiler; decals for either Keke Rosberg or Manuel Reuter's car; window masking; one-piece, mesh-pattern wheels and rubber racing slicks; a 540 stock motor; and a 3-step mechanical speed control. Did I mention the substantial front bumper? I must say, I'm glad it's included.

## TEST GEAR

I ran the Opel with the included 3-step mechanical speed control and 540 motor. I added JR\* Python radio gear, which

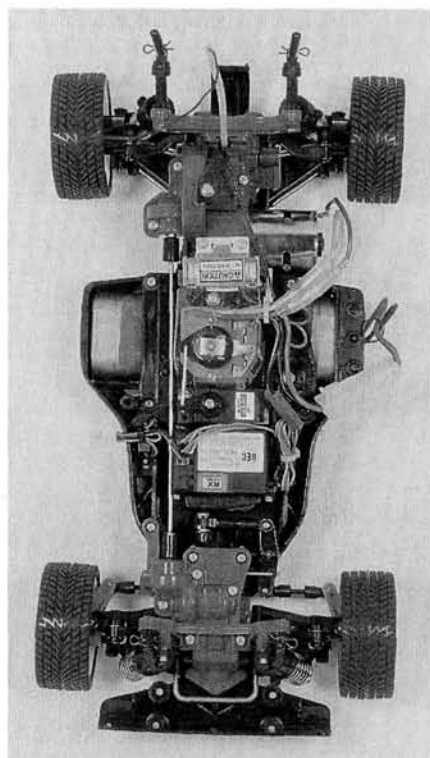
includes two NES-510 servos and an NER-102 AM receiver. The Python transmitter is comfortable to hold and offers a lot of features for the money.

Current was provided by a Tamiya 6-cell 1400 SCR pack. I also added a full set of Pro-Line\* Sedan Hawg tires, which fit perfectly on the Opel's wheels.

## PERFORMANCE

After 8—that's right, 8!—total hours of wrist-breaking assembly (screwing in all those self-tapping screws takes some muscle), I charged up my battery pack and let it

(Continued on page 56)



*Although it may look crowded inside, the TA02 design is well thought out and has proven to be a durable sedan platform.*

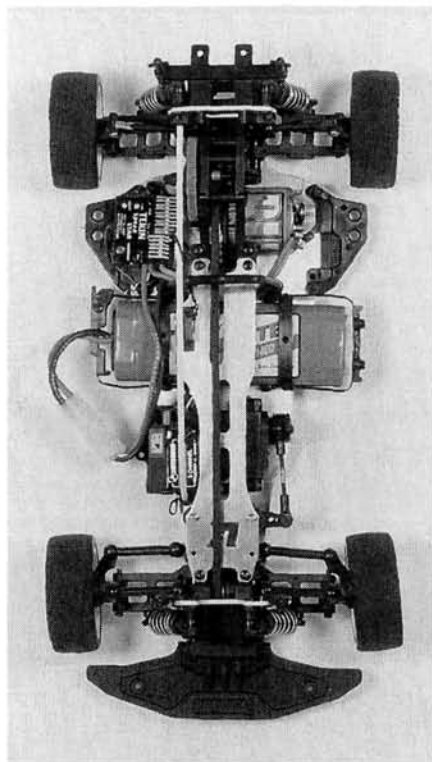
# Building and Setup Tips

- Read the entire instruction manual before you open any of the parts bags.
- If you plan to use the 3-step mechanical speed control, the instructions are in the bag with it—not in the instruction manual. I discovered this after about half an hour of trying to figure out why step 25 of the instruction manual was telling me to mount only a steering servo. I may be a beginner, but I knew I needed two servos—one for steering and one for throttle. It was a bummer when I finally found the instructions and saw that they included alternate steps that started back at step 2 of the regular manual; I had to take apart the rear gearbox to add the mechanical speed-control mount.
- Be organized. I found that the muffin-tin method of organizing all the little pieces really works; otherwise, they get all over (especially if your cat's a thief!). The muffin tin keeps them all in one spot, and every compartment can be labeled.
- Buy Lexan scissors. Regular scissors, embroidery scissors, hobby knives and Swiss Army knives do not cut it—literally. I struggled for way too long trying to cut out the wheel wells.
- Work out for at least a month before attempting to thread all those very special self-tapping screws into the plastic. You are the "self" who will be doing all the tapping.
- Do not spray paint one spot for too long. Paint runs and makes not-so-attractive streaks in your paint job—streaks that you can't easily hide with decals.
- Avoid driving the car into solid, cement objects and oncoming traffic. The results are not pretty.

## SPECIFICATIONS

SCALE .....	1/10
LIST PRICE .....	\$305
<b>DIMENSIONS</b>	
Overall length .....	17.5 in.
Wheelbase .....	10.88 in.
Width (F) .....	8.65 in.
Width (R) .....	9 in.
WEIGHT (gross, RTR) .....	3 lb., 5 oz.
<b>CHASSIS</b>	
Type .....	Tub
Material .....	Plastic
<b>DRIVE TRAIN</b>	
Type .....	Sealed dual-transmission with drive shaft
Primary .....	Pinion/spur
Transmission .....	Dogbones/axles
Differential(s) .....	Gear (F); ball (R)
Slipper clutch .....	None
Bearings/bushings .....	Bushings
<b>SUSPENSION (F/R)</b>	
Type .....	Lower A-arm with fixed upper link
Damping .....	Plastic oil-filled, coil-overs
<b>WHEELS (F/R)</b>	
Type .....	Mesh-type, plastic, one-piece
Dimensions (DxW) .....	1.875x1 inch
<b>TIRES (F/R) .....</b>	
Slick semi-pneumatic	
<b>ELECTRICS</b>	
Motor .....	540 stock
Battery .....	Not included
Speed Control .....	3-step mechanical





From overhead, you can see that the new Kyosho TF-2 features a relatively straightforward, simple, belt-driven, 4WD design. There's plenty of room to mount almost any ESC and receiver.

## SPECIFICATIONS

SCALE ..... 1/10  
LIST PRICE ..... \$199.99

### DIMENSIONS

Length (overall) ..... 18.25 in.  
Wheelbase ..... 10.28 in.  
Width (F) ..... 7.81 in.  
Width (R) ..... 7.75 in.

WEIGHT (gross, RTR) ..... 3 lb., 7.5 oz.

### CHASSIS

Type ..... Flat plate w/upper deck  
Material ..... Aluminum alloy

### DRIVE TRAIN

Type ..... Two, toothed belts  
Primary ..... Pinion/spur gear  
Transmission ..... Dogbones/axles  
Differential(s) ..... Bevel gear  
Slipper clutch ..... None  
Bearings/bushings ..... Lubricant-impregnated bronze

### SUSPENSION (F/R)

Type ..... Independent lower control arm/upper link  
Damping ..... Coil spring

### WHEELS (F/R)

Type ..... One-piece molded mesh  
Dimensions (DxW) ..... 1.9x1 in.

TIRES (F/R) ..... Kyosho rubber racing slicks



(Continued from page 53)

performance until later in this article.

Because of space constraints, the speed control is mounted on a removable tray to allow access to the motor mounting screws. A set of high-quality bronze bushings round out the sport version. Ball bearings are the first upgrade that I'd make.

## TEST GEAR

I wanted complete control of this sedan, so I started by installing my Airtronics\* Caliber 3P coupled with the speed of an Airtronics 94737 high-speed servo. I then opted for a Tekin\* 412-P electronic speed control and used a Trinity\* Speed Gems Ruby machine-wound, 16-turn triple motor to spin the wheels. Dynamite\* 1400 SCR sport packs provided the power.

## PERFORMANCE

I took the Opel to a tennis court and put it to the test. The driveline is simple and efficient; the belt tensioner works great; and there was no hint of the belt slipping when I hit the throttle.

Unfortunately, the tires that accompany the kit didn't hook up well on the slick surface of the tennis court, but within a minute or two, I was accustomed to the wheelspin and was happily slapping the power down

and drifting through the turns. If you've never owned a 4WD vehicle, you won't be able to appreciate this sensation; I did, through every corner!

This car's handling characteristics are as predictable as the sunrise. If you mash the throttle through a turn and keep the throttle pinned, the car pushes. If, in that same turn, you momentarily interrupt the throttle and get back onto it, the car kicks into the fantastic phenomenon of 4WD drift. After a few such corners, driving the TF-2 becomes an addiction. I found myself trying to get the car to go as sideways as possible before the laws of physics took over. If you start to lose control, the simple corrective action is to let go of the throttle and watch as the car is snapped back in line and awaits its next command.

Braking is mind-boggling; hit the brakes and the car looks as if it dropped anchor. Don't try to drive the TF-2 like a 2WD car and don't hit the brakes while cornering, or you'll find yourself peeling the stickers off the curb you just met.

After several packs, I was ripping through turns left and right (obviously!). The Airtronics 94737 servo responded flawlessly to every turn of the wheel. Acceleration was like lightning; would you

(Continued on page 57)

## Building and Setup Tips

The Calibra comes packaged in an attractive, multicolored box, and all the parts are neatly bagged and labeled for easy identification. The instruction manual is typical Kyosho—very clear illustrations with easy-to-understand text. All the moldings are of good quality, and all the suspension components are molded out of nylon composites.

This is one of the easiest 4WD cars to assemble correctly. I just followed the instructions, which are excellent, and assembly took three hours from start to finish (minus the paint job). Absolutely no hand-fitting was required. I only had one problem during assembly: the instructions are vague as to where the bushings should stop on the main gear. The two-piece bushings fit tightly on the shaft, and I assumed they should go fully against the gear. You can probably guess that I was wrong. The bushings just go on to the point at which their outer edge is flush with the edge of the gear.

Other than this minuscule gripe, if you follow the directions, you shouldn't have any difficulties.



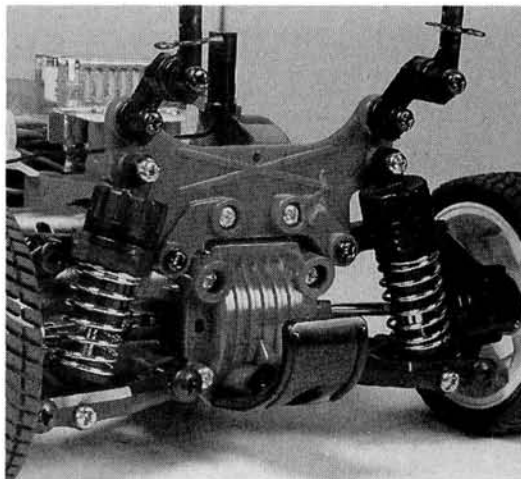
## Tamiya Opel Calibra V6 DTM

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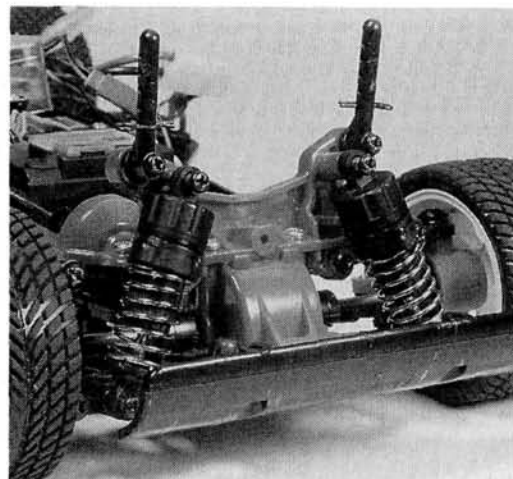
rip. Well, not exactly rip. I figured I should start small (it was 1:30 in the morning, after all), so I ran it around my living room and kitchen—slowly, but with enough speed to drive my cat crazy.

The next day, I moved to a more appropriate setting—the driveway. I was amazed at how fast the car could move. And move it did—right into the street. Lucky for me, traffic was slow and I was faster. I was having trouble getting used to the throttle on my radio; it seemed to be backwards. When I pulled back on the throttle, the car went in reverse. I found out that my radio has a throttle-reversing switch—a minor dilemma solved. After I had made a few minor adjustments, steering and cornering were excellent. Sliding around turns got to be fun. Look, ma, I'm drivin'!

I decided it was time to tackle a real parking lot, so I headed for the beach. The lot was sandy, so sliding through turns became more like spinning through them—360-degree spins, to be exact. I discovered countersteering and regained some control. Again, the Opel's steering was very responsive. There was a lot more space in the parking lot than in my driveway, so I ran at full throttle. The Opel accelerated quickly; I had it zoomin' around the lot in no time. Then, from out of nowhere, a curb jumped up—right in front of the car! (Has this ever happened to anyone else?) I thought it was all over. With my head hung low, I walked over to survey the damage. To my surprise,



**In back, oil-filled plastic shocks handle the damping chores. An access hatch allows you to get to the rear ball diff easily; remove four screws, and it pops right out.**



**Up front, you'll find oil-filled shocks, a gear diff and Pro-Line Sedan Haws.**

### THINGS YOU'LL NEED

- Battery pack.
- Battery charger.
- Radio gear with two servos (or one servo and an ESC).
- Paint for the body.
- Assorted screwdrivers.

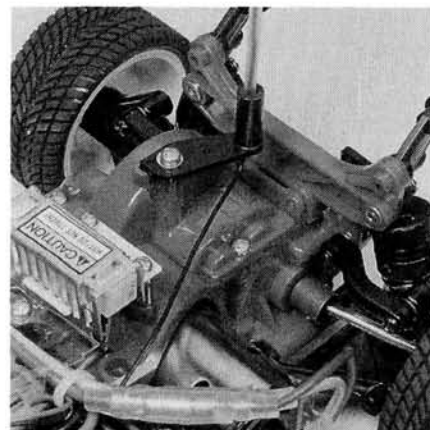
### FACTORY OPTIONS

- Ball bearings—part no. 53167.
- Graphite chassis plate—53166.
- Speed-tuned gear set—53127.
- Various tire and wheel sets.
- Optional 24- and 25-tooth pinion set—50477.
- Universal shaft set—53172.

except for a few munched decals and bumper scrapes, the car was fine. I don't recommend bashing into curbs, but it's good to know that the Opel is sturdy enough to withstand the rigors of inexperienced driving.

After I had gone through a few battery packs, I began to experience some glitching with the 3-step speed control. I kept getting stuck in reverse. Apparently, you need to clean the control's metal contacts from time to time because built-up dirt and crud can make the little wiper arm stick.

The kit's speed control works OK, but you should eventually upgrade it to an electronic speed control (ESC). ESCs provide much smoother throttle response, and lots of manufacturers offer low-end models at very modest prices. I think that you should also upgrade to a full set of ball bearings—



**A stock 540 motor and a 3-step mechanical speed control are standard equipment on the Tamiya Opel. Those who want a little more pep will shelf these items in favor of an ESC and a hotter motor.**

when your budget allows. The kit's plastic bushings work well when they're new, but they'll quickly wear and cause lots of slop in the transmission and axles.

### FINAL THOUGHTS

The Opel Calibra V6 DTM is durable, easy-to-build, fast and fun to drive. Beginners will find its construction appropriately challenging. Experts can modify the TA02 chassis to their heart's content using Tamiya's extensive line of hop-ups. Looking back, I can honestly say that I enjoyed my first R/C adventure. If I could only prevent those curbs from jumping out into the middle of the road....

\*Addresses are listed alphabetically in the Index of Manufacturers on page 264.

## Likes

- Superior detailing.
- Easy-to-follow instructions with full-size diagrams.
- Great handling and suspension.
- Very durable.

## Dislikes

- Instructions for the 3-step speed control are on a separate sheet.
- Lexan cover for the 3-step doesn't lie flat.

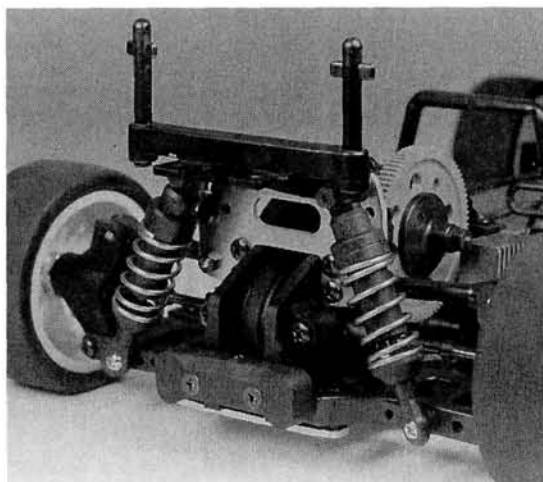


# Kyosho Opel Calibra V6

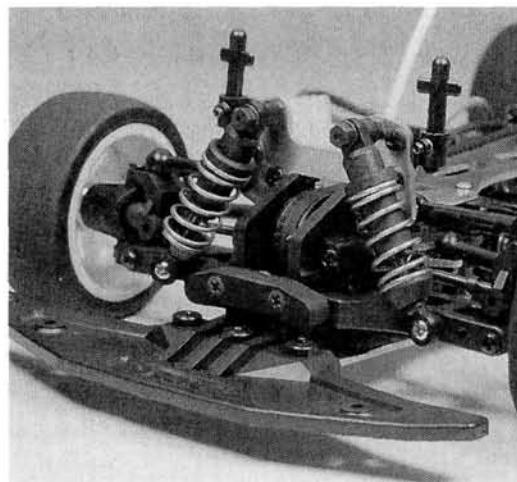
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expect less from a 4WD?

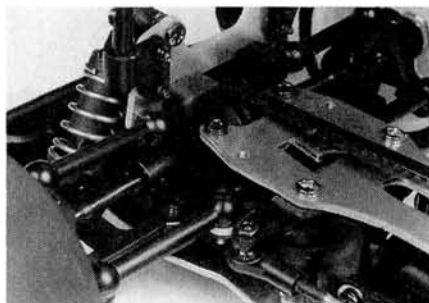
I had a blast driving this car, but just days before the photo shoot, I was checking how the car reacted in high-speed sweepers when disaster struck. While making a long, hard left, I hit a crack in the pavement that sent the car into a slow-motion roll. I felt each and every hit the car took. Luckily, only two of the stickers were ruined, and the passenger mirror was twisted. I brushed off the dirt and fixed the mirrors to continue my attack on the parking lot



**In back, slick tires get the power to the ground. The coil-spring shocks are not oil-filled, so you might want to upgrade them as your skills progress and your budget allows.**



**A massive bumper protects the front end from most "entry-level" impacts. Hey!...who doesn't crash at one time or another?**



**The TF-2 is equipped with smooth gear diffs both front and rear.**

(although I did drive much less aggressively after the accident).

On smooth surfaces, the kit's coil-spring shocks worked well enough, but they came up short on bumpier pavement where the lack of damping caused the Opel to bounce excessively. After a full set of ball bearings, the next essential modification I recommend is a set of oil-filled shocks.

## Likes

- Excellent handling right out of the box.
- Scale realism.
- Simple construction.
- User-friendly instructions.
- Aluminum chassis.
- Low price.

## Dislikes

- No oil-damped shocks.
- Too many screw heads protruding from the bottom of the chassis.

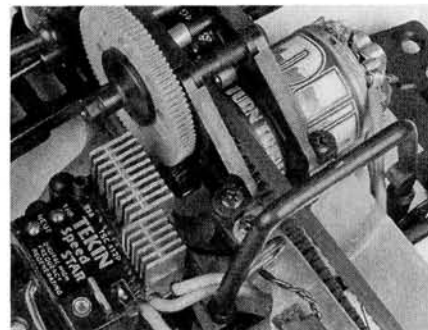
### THINGS YOU'LL NEED

- 2-channel radio
- Servo
- ESC
- Batteries
- Charger

### FACTORY OPTIONS

- Adjustable rod set—part no. SPW-5
- Special roll bar—SPW-53
- Stabilizer set—SPW-56
- Ball bearings—3x6, 5x10 and 8x14mm—96473, 1901, 1911
- 5.8mm ball end—LA43
- Front one-way set—W5111
- Universal swingshaft (L)—W5066
- Ultimate shocks (S)—W5097
- On-road shock spring (S)—92491
- Slick tire (high-grip)—92442
- Color wheel
  - Mesh/silver—924455S
  - Mesh/black—924455B
  - Mesh/gun metallic—924455G
- Wide, slick tire (high-grip)—92551
- Wide color wheel
  - Mesh/silver—92555S
  - Mesh/black—92555B
  - Mesh/gun metallic—92555G
- Urethane foam bumper—39401
- Lapboy set (BEC)—90326

The speed was good, although I may have over-gearred the Ruby motor a tad because I used the stock pinion, which was intended for a stock motor. I would love to see this car with the optional 2-speed transmission. I can only imagine the speed!



**I tested the TF-2 with a Tekin TSC 412-P Speed Star and a Trinity Ruby Speed Gems motor.**

### FINAL THOUGHTS

All cars are basically judged (regardless of price) on one thing—performance. If a car does not perform, it does not sell. Kyosho, I'm warning you to be prepared to sell a horde of these babies.

I've heard rumors that Kyosho cars are difficult to assemble and maintain, but I can't see the truth in that, because this is one of the simplest cars I have ever assembled. If you aren't the sport-minded type, a performance version is available and, if you already own the sport version, the list of options is long and diverse. This car's handling is excellent, and it's a blast to drive. I like the look of the aluminum chassis, but the number of button-head screws on the bottom is incredible. I would rather have seen countersunk holes, which would be less likely to drag on the ground.

Did I mention the car is a *blast* to drive? The touring car craze has begun. Maybe 4WD has a chance here in the U.S. after all!

\* Addresses are listed alphabetically in the Index of Manufacturers on page 264.





# Budget sport racer



## Specifications

SCALE	1/10	SUSPENSION (front)	Kingpin/coil spring
LIST PRICE	\$99.95	WHEELS	
DIMENSIONS		Front (DxW)	1.875x1.187-inch-wide, one-piece nylon
Overall length	18 in.	Rear	2-inch-wide, one-piece nylon
Wheelbase	10.187 in.	TIRES (F/R)	Foam, blue dot/green dot
Front track	7.875 in.	ELECTRICS	
Rear track	8.25 in.	Motor, battery, ESC	Not included
WEIGHT (gross, RTR)	2 lb., 10 oz.	CHASSIS	
Type	Vertical plates	Type	
Material	Fiberglass	Material	
DRIVE TRAIN		Type	
Primary	Solid axle, direct drive	Pinion/spur	
Differential	Pinion/spur	Ball type	
Bearings/bushings	Ball type	Bushings	

## Things You'll Need

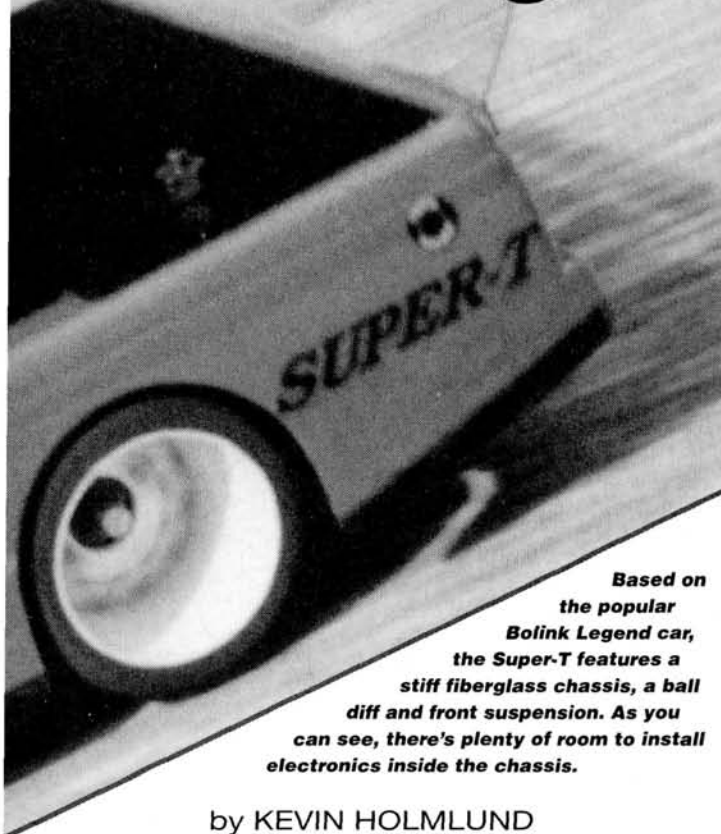
- Radio
- ESC
- Charger
- Battery pack
- Steering servo
- Servo-saver
- Paint (for the body)

## Factory Options

- Aluminum diff hub—part no. BL-3518.
- Aluminum hub left—BL-3514.
- Battery tray—BL-5242.
- Ball bearings (6)—BL-5451.
- Dodge Supertruck body—BL-2279.
- Ford Supertruck body—BL-2283.



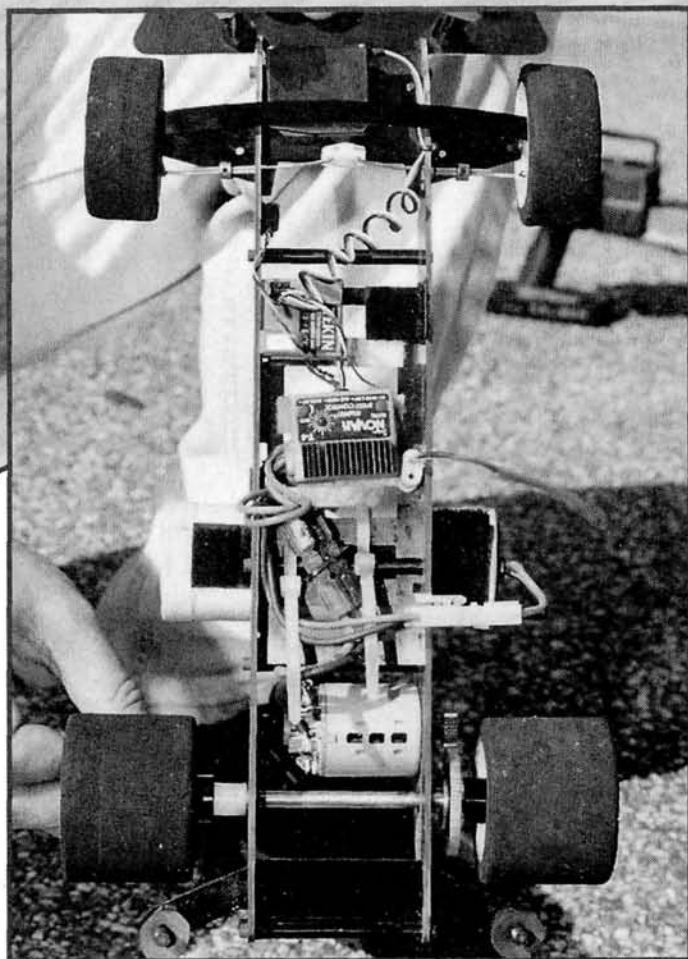
# with a Legendary heritage



Based on the popular Bolink Legend car, the Super-T features a stiff fiberglass chassis, a ball diff and front suspension. As you can see, there's plenty of room to install electronics inside the chassis.

by KEVIN HOLMLUND

## Bolink Super-T



PHOTOS BY JOHN HOWELL

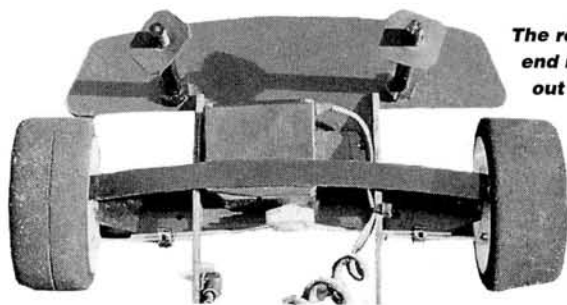
**M**Y FIRST R/C CAR (some 15 years ago) was a 1/12-scale Bolink\* Lamborghini, so I was thrilled when I was asked to do the "Thrash Test" on Bolink's 1/10-scale Super-T truck. I drive a truck, so this suits me to a T (sorry, I *had* to say it!). The Super-T is an inexpensive, entry-level racer designed for backyard R/C enthusiasts who may already have an R/C car and want to dabble in the world of on-road racing.

### KIT FEATURES

The kit is basically the same as those in the Bolink Legend series, except it has a truck body. The chassis components consist of

computer-designed, 3/32-inch-thick fiberglass plates. The Super-T's chassis design is different from the typical on-road pan car. The main chassis is made of two vertical plates. The front suspension plate and the rear body mounts are located horizontally between these vertical plates, which are bolted together with nylon supports and socket-head cap screws. This design also provides strength in the event of a head-on collision (a benefit for beginners), but the stiff chassis is unforgiving going over bumps and small rocks.

The front suspension is a Bolink kingpin coil-spring setup, and suspension adjustment is limited to toe-in and toe-out.



*The relatively non-adjustable front end is very simple; only toe-in, toe-out and springs can be adjusted.*

*I trimmed the servo ears so that I could put the servo horn in the center of the chassis.*

There's no rear suspension, so the chassis absorbs a lot of "road shock." Unlike the Legend kits, the Super-T has black nylon wheels with low-profile tires; also, the battery pack is placed across the chassis so there's no need for a battery tray.

### likes

- Low price.
- Good instructions/easy to build.
- Good-looking body.

### dislikes

- Rear tires not very true.
- Front tires wear out too quickly.
- Rear spoiler pictured isn't included with the kit.
- No differential lube.



# Building and Setup Tips

- The rear-axle bushings are difficult to insert into the chassis. You can carefully hammer them in. I pressed them in with a vice and had a socket on the other side for support. Whichever method you use, be sure to support the back of the fiberglass plate.

- When you attach the nylon supports, wrap them with a piece of bicycle inner tube and grip the tube with pliers; pliers tend to scratch them up.

- To create a better fit when the two vertical chassis plates are screwed together, before step 3 in the instructions, file the corners of the front axle plate and rear body mount where they rest against the chassis plates.

- In step 12, if you can't get the axle to spin freely, roll up some 600-grit sandpaper and pass it through the bushings. With the axle installed, add a few drops of oil, then work the axle back and forth while you spin it. Repeat the process until the axle spins freely.

- In step 13, after you've tightened the left wheel-hub setscrews, remove the hub and axle, and file a flat spot on the axle where the setscrews left a mark. During a race, if the hub becomes loose, the setscrews will keep the wheel rotating and help you make it to the finish line.

- To help you place the servo just right and put the steering links through the sides of the chassis, in step 19, before you lower the servo onto the front axle plate, remove one side of the kingpin brace and move it out of the way.

- Adjusting the ESC can be frustrating when it's mounted on the side of the chassis. The instructions suggest that you mount the ESC and receiver on top of the battery tray and place the battery pack under it. I also recommend this.

- If you mount the antenna where the instructions suggest, you'll need another hole in the hood—not on my truck! I moved the antenna to one of the slots on the edge of the battery tray and taped it to the chassis.

- The pictures on the box show a rear spoiler, but one is not included in the kit. When you trim the body, use the portion below the rear bumper to make a spoiler, and attach it with double-sided tape.

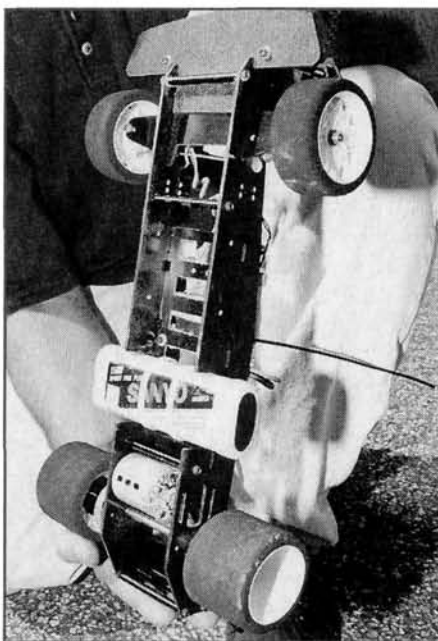
## TEST GEAR

I used Trinity's\* Green Machine 2 stock motor to provide the horsepower, while Novak's\* T-4 ESC (it might be considered an antique by today's standards, but it works well) controls the horsepower. A Tekin\* receiver and my trusty Futaba\* Magnum Junior transmitter handle the radio signals. A reasonably priced Futaba S148 servo handles the steering.

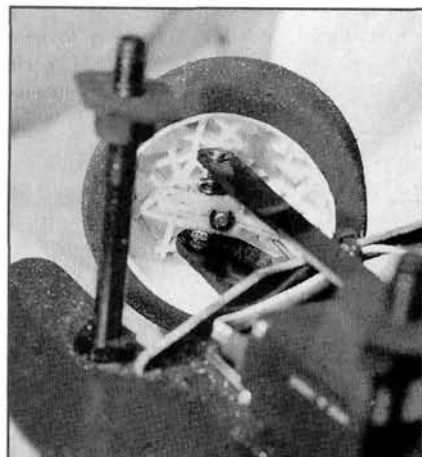
## PERFORMANCE

The first test site was a very dusty tennis court with six courts in a row. The truck spun out very easily, although straight-line speed was quite impressive. I went through three battery packs and then, with a very dirty truck, I headed home for some tinkering. I noticed the rear tires were not very true, so I trued them on my metal lathe. Most hobby shops will do it for you for a small fee.

The second test site was a parking lot. This time spinouts were reduced, and the Super-T seemed to run more smoothly overall. Halfway through the second run, a small pebble became lodged in the pinion gear and totally wasted the spur gear. The front tires were wasted as well—so, back home for more tinkering. I replaced the 81-tooth spur gear with a 78-tooth spur gear from Robinson Racing\*. I also replaced the front tires with DuraTrax\* green dots, medium-compound, BBS-style wheels, and I gave the steering a little less toe-in. I also moved the battery pack.

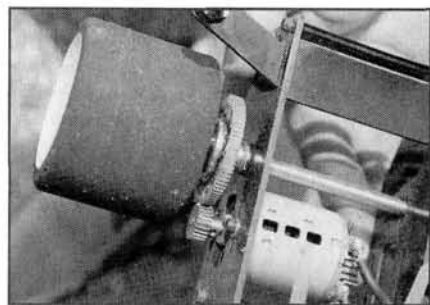


**I mounted the battery under the chassis to give the truck an overall lower center of gravity. The battery can also be mounted in-line under the electronics.**



**The Super-T comes with kingpin/coil-spring front suspension. There is no rear suspension, so this truck is best suited to smoother pavement and carpet driving.**

The third test site was a much cleaner tennis court, which was a lot of fun! The Super-T handled much better than before



**For smoother handling and better power-to-the-pavement distribution, a ball diff comes standard on the Super-T.**

and was more predictable in the turns.

Run time with my old 1200 SRC batteries was just over 4 minutes; with a new 1500 sport pack plus, run time increased to 6.5 minutes. I ran both packs with the 78-tooth spur gear.

## FINAL THOUGHTS

The Super-T does what it's designed to do: it gives beginners and backyard bashers a look at on-road racers. It's easy to build, and the investment is very low if you already have an R/C car.

The Super-T's stiff chassis and lack of rear suspension make it bounce so that it's difficult to control in parking lots that are not well-groomed, but on smooth surfaces, the truck is a lot of fun. The Super-T could compete in the Sport class that some tracks have for higher-level cars and trucks, but remember, it's an entry-level truck, and you race it to have fun!

\*Addresses are listed alphabetically in the Index of Manufacturers on page 264.







# Reader's Ride of the Year:

RANDY COOLBAUGH'S

## "Terminator 3"

# Spy/Assault Vehicle





# Vehicle

by Frank Masi



PHOTOS BY WALTER SIDAS

**A**RE YOU READY for something a little different? How 'bout a whole lot different? Randy Coolbaugh's "Terminator 3" R/C assault vehicle is perhaps the most formidable project yet to pass through the doors of the Car Action offices. Randy started his project in 1989, as a "personal challenge." He wanted to build a fully functional, scale,

spy/assault vehicle that could be controlled without visual contact for distances of up to 2,000 feet. He also wanted to incorporate a working flamethrower, proximity and incline alarms, a "bionic ear" listening device and a working missile turret.

After a month of sketching and planning, Randy finally came up with the T3's basic body design by combining features from a modern Hummer and a German WW II half-track called a GREIF. Randy knew that, at some point, he'd have to make the vehicle operational, but first, he had to find a suitable chassis.

- ✓ flamethrower
- ✓ rocket launcher
- ✓ infrared camera
- ✓ proximity alarm
- ✓ laser sight
- ✓ 4WD
- ✓ working plow

# Seek and Destroy Toy



The creator of the T3, Randy Coolbaugh, with his other "ride"—a full-size Kenworth semi.



## CRUISIN' FOR A BRUISER

After careful consideration, Randy settled on the perfect chassis for the T3—a Tamiya\* Bruiser. Finding one in suitable condition, however, was difficult; at the time, Tamiya hadn't yet re-released the Bruiser as the Mountaineer. After a few months of asking around, Randy learned that his cousin in Long Island had one (for a price!). When he got the chassis, he was ready to start.

First, Randy modified the Bruiser chas-

sis to ensure that it would be able to cope with the extra weight of the vehicle. He added five additional leaves to the rear springs, then added sway bars, radius rods, panhard links and centi-lever coil-over shocks. For cool operation, he fitted the stock motor with a copper cooling coil and a belt-driven, twin-gear pump, and he made a hard-lined radiator with a thermostatically controlled fan.

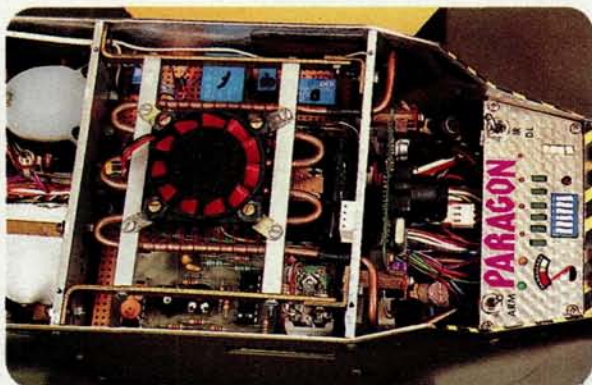
He was then ready to draw blueprints and lay out all the inner workings, including the servos, electronics, plumbing and wire-harness roughing.

## INNER WORKINGS

After Randy had made sketches of the body parts, he made schematic drawings of all the basic circuits that would bring the Hummer to life. Beginning with the receivers from two Futaba\* 4-channel radios, he assembled the circuit boards that would control the functions.

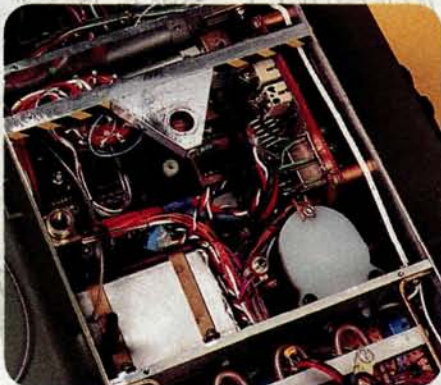
The truck body is divided into four compartments that are separated by 1/8-inch-thick bulkheads. The compartments house an array of components:

- Compartment one is the "main control center" that houses the switch panel, LED



The video camera, light sensor, audio microphone and switch panel are mounted inside the first compartment, just behind the windshield. Toward the rear is the hard-lined radiator with its twin-gear-driven pump and thermostatically controlled fan.

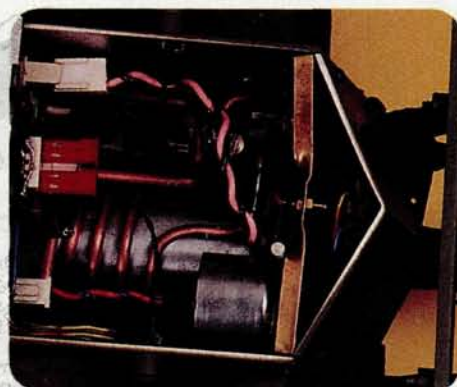
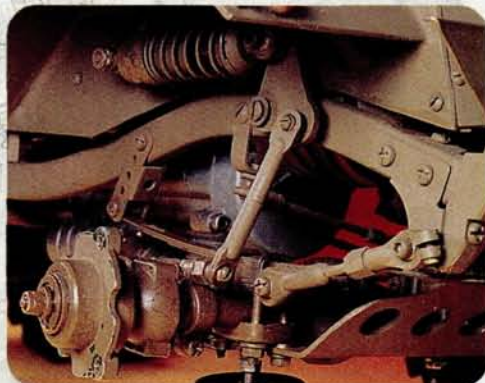
The fuel tank and electric pump for the T3's flamethrower are mounted on the bulkhead in the truck's third compartment. This space also houses the servos that control the turret movement and switching and hydraulic functions.



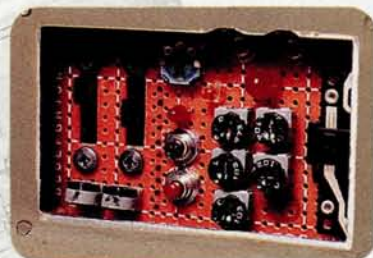
For extra "holding power" when parked on inclines, the T3 has a custom, "emergency" disk-brake system mounted on the rear axle's drive shaft.



The stock Bruiser's suspension was extensively modified to handle the extra weight of the T3. Sway bars, radius rods, panhard rods and additional leaves for the springs were added. Note the custom-made, centi-lever shock system.



To handle the additional weight of the T3, the stock Bruiser motor was wrapped with a copper cooling coil that leads to the custom-made radiator.



This easily accessible control panel on the side of the truck contains all the variable resistors and the audio controls.





## SPECIFICATIONS

**SCALE**.....1/10

### DIMENSIONS

Length (overall).....23 in.  
Width.....9 in.  
Height.....11 in.  
Wheelbase.....11.5 in.  
—front track.....7.75 in.  
—rear track.....9 in.

### WEIGHT

—w/batteries.....29 lb.  
—without.....27 lb.

**CHASSIS**.....Steel ladder (Tamiya Bruiser)

**DRIVE TRAIN**.....Stock 750 motor with liquid cooling

**TRANSMISSION**.....3-speed manual shift with automatic hubs in 4WD and full ball bearings

**SUSPENSION**.....Solid axle with leaf springs

**DAMPING**.....Oil-filled, coil-over shocks on centi-lever linkages

### ARMAMENT

- Turret—8-degree rise with 90-degree rotation
- Single rocket range—up to 1 mile
- Cluster rockets range—up to 50 yards
- Flamethrower range—5 feet
- Laser—Class III, 65-foot range, 1/4-inch red dot

indicators, video camera, light sensor and audio microphone. The video camera has a 76-degree field of view and, using infrared, can "see" up to 8 feet in total darkness.

• Compartment two contains all the circuitry, including the receivers, speed control, signal monitor, laser-drive circuit, temperature sensor, light sensor, warning circuitry and flasher circuit for the plow warning lights.

• Compartment three houses the mechanical components: the turret servos, switching servos, hydraulic servo, fuel tank, pump for the flamethrower and an accessible circuit control panel with all the variable resistors and audio controls.

• Compartment four holds the power-supply grid and inverters for 5 and 9 volts. The audio/video (A/V) transmitter is mounted on the bulkhead in this compartment.

The A/V transmitter links the control unit to the truck. A 2-channel amplifier in compartment four is connected to a roof jack for the turret-mounted "bionic ear" for pinpoint listening.

All the sensor circuits—tilt, battery level, proximity, etc.—are linked by fiber-optic lines to a buzzer that is sent via an audio signal back to the control unit. Sensors produce different buzzer sequences for identification. For example: the tilt and proximity sensors produce a steady tone, while the battery monitor and signal monitor produce a pulse tone. This helps the operator to identify a problem and react.

The rest of the body—the sides, fenders and roof—are made out of 1/16-inch-thick aluminum, and brass detailing is used on the radiator grill and bumpers.

## CONTROL

For control, Randy uses two 4-channel Futaba radios. One controls the driving functions—throttle, steering and transmission; and the fourth channel controls the master cylinder for the working plow.

The second radio controls the armament. Channels one and two raise and rotate the turret (it can be elevated 18 degrees and rotated 90 degrees). The turret can launch rockets of up to 1 inch in diameter and 4 inches long, or the MRLS (Multiple Rocket Launching System) can be attached for two rounds of three rockets each.

Channel three operates a six-position rotary switch that activates the laser sight for the turret, the emergency brake and rockets A, B and C (B and C are MRLS). Finally, channel four controls the flamethrower via a Ramtronics relay. Randy hasn't used the flamethrower yet for fear of sending his project up in flames, but he predicts that it will have a range of up to 5 feet, depending on the vehicle's pitch.

Randy is currently working to complete the control unit, which will consist of the two 4-channel transmitters and a black-and-white C.R.T. monitor with a 4-inch screen and an audio recording deck with a 7-band input equalizer to filter out unwanted noise for precise recordings. For now, Randy drives the T3 using the two transmitters, and he keeps it where he can see it.

## A READER'S RIDE TO REMEMBER

Randy's project is one of the most spectacular examples of great design, ingenuity and imagination that we've ever seen, and we're sure that you'll agree. Congratulations, Randy; your check for \$500 is on its way, so please don't sick the T3 on us!

\* Addresses are listed alphabetically in the Index of Manufacturers on page 264.

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THORP ALUMINUM  
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FOR RC10GT

NEW COMPANIES  
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&  
BME

A&L	Fine Design	Racer Choice
Airtronics	Gator	Racer's Edge
Aero Tech	Genesis	Racetech
A-Main	Holeshot	Raceway mfg
Andy's	Hot Socks	RCM
Associated	HPI	RCPS
Astro Flight	Hyperdrive	Robinson
Autographics	Irrgang	Royal
Barracuda	Jammin	RPM
BBR	Kimbrough	Saiko
Bel-Ray	Lightning Rod	Sassy
Body Shop	Lightspeed	Schumacher
Bolink	Litespeed	Southworth
BRP	Lunsford	Speedworks
CRC	Matrix (Integy)	Stage III
C&M/Cobra	Max Cell	TA Emerald
Cam	McAllister	TD Ent.
Chicago mod	MIP	Tamiya
Comp. Elect.	NMB	Team Losi
Comp. Craft	Novak	Tecnacraft
Cooper	Ofna	Teddy's
Crowe	Ozone	Tekin
Dahm's	Paragon	Thorp
Dan's RC	Parma	Traxxas
Delta	Pole Position	TRC
Dubro	Power Source	Trinity
Dumore	Precision Mot.	TQ
East Coast	Pro Fit	Twinn-K
Edge	Pro Line	Twister
Elite Speed	Progressive	Upscale
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Excel	Pyramid	W.S. Deans
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# 160 racers turn out for the big



by FRANK MASI

**G**AS OFF-ROAD RACING in the U.S. is still in its infancy. Despite the recent popularity of  $1/10$ -scale, nitro-powered racing trucks—especially Team Associated's RC10GT—there isn't much racing at the grassroots level.

To promote interest in this class, Kyosho USA and this magazine have sponsored a series of events for  $1/8$ -scale buggies and trucks and  $1/10$ -scale nitro trucks. Of these races (two or three every year), the Gas Off-Road World Challenge, now in its fifth year, is the most prominent.

Originally held at Hobbico's Champaign, IL, headquarters, the event has since moved to the Detroit, MI, suburb of Sterling Heights—Freedom Hill Park, to be exact. If this location sounds familiar, it should; it was the venue for the 1991 IFMAR Off-Road World Championships.

Held over the weekend of August 25, 26 and 27, as in previous years, the World Challenge certainly lived up to its name. Over 160 racers from the U.S., Canada and Britain competed for top honors in three classes:  $1/8$ -scale buggy,  $1/8$ -scale truck and  $1/10$ -scale truck. The racing action was intense, and several manufacturers unveiled new products for the nitro market.



PHOTOS BY FRANK MASI

## QUALIFYING

•  **$1/8$ -Scale Buggy.** The 75 entries in this class seemed to be split evenly between Kyosho Infernos and Mugen Athletes, with a smattering of OFNA Pirates and the new Ultra GTs, plus a few Cronos thrown in for good measure.

Several team drivers used Kyosho's hot new Inferno MP-5,

## Fifth Annual Car Action/Kyosho

# Gas Off-Road World



# st gas off-road race in the U.S.

which, at the time of this writing, are in short supply. (I think there are only 10 in the U.S., and seven debuted at this event.)

Through the four rounds of qualifying, it looked as if Kris Moore was in a class by himself. He seemed able to will his MP-5 around the course, swinging its rear tires around turns and, in usual Moore fashion, having the time of his life.

Derek Furutani was Moore's closest competitor in speed, but he ran out of fuel during every one of the first three rounds as his Mugen sputtered to a halt just before the 7 minutes expired. In the fourth round, the wisdom of making a quick swap to a new Rex 3-port engine soon became apparent: Furutani solidified his second position in the A-Main, behind Moore. An interesting note: despite his failure to finish a complete run before the fourth round, Furutani was still comfortably in the A-Main!

The fourth round seemed

to be fruitful for others as well; all but two of the A-Main field posted their quickest times. Matt Ledger, Canada's Dave Henry, Britain's Mike Craddock, last year's winner Doug Von Mosch, ROAR 1/8-scale on-road national champ Chris Tosolini and Canadian Peter Head all turned in their best performances during the fourth round.

**Kris Moore won in 1/8-Scale Buggy with an exciting finish.**

**Winner of the 1/10-Scale Truck A-Main, Pat McCreery.**

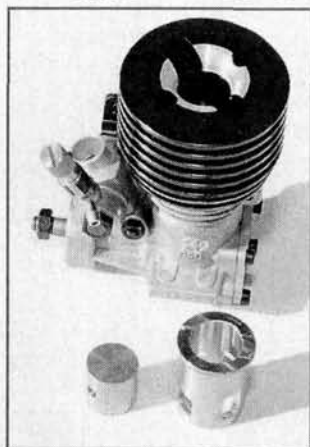
**Tim Long, winner of the 1/8-Scale Truck A-Main.**



# orld Challenge

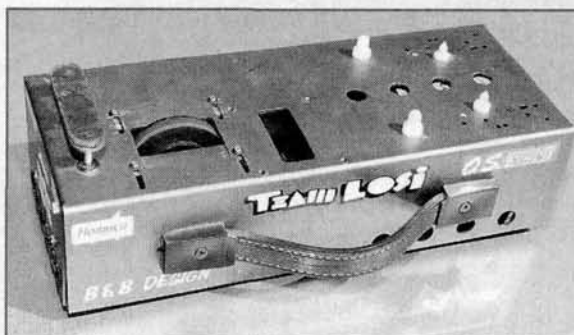
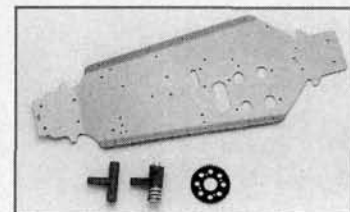


# New in the Pits



## Thunder Tiger Horsepower

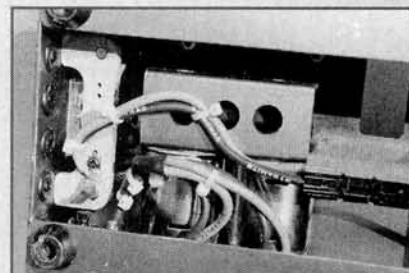
Bill Jeric brought along samples of Thunder Tiger USA's\* newest powerplant: the Tiger .12 BZ, which features ball bearings, a chrome piston and sleeve for increased engine life, and a large, aluminum, heat-sink cylinder head. The .12 BZ engine is listed at only \$129.99 but is available at a "street price" of about \$78. Thunder Tiger also makes chrome piston-and-sleeve kits that fit the O.S. CZ-R and CZ-Z .12 engines. There's also a version of the .12 BZ made specifically for the RC10GT. It's called the BZ(A), and it's available with a pre-cut crankshaft.



## Start Me Up

Brian Turner of Grand Rapids, MI, is behind this neat project. Brian modified Kyosho's\* 1/10-

scale starter box to give it a dose of heavy horsepower. He bolted in two electric motors (instead of one) and dumped the 6-cell pack that usually powers the box in favor of a 12V gel-cell. Brian claims that the box will have no trouble starting new, "tight" engines.



## MP-5 Goodies

Kyosho unveiled some new hop-ups for the spankin' new Inferno MP-5. Among the mods are a new, thicker, duralumin chassis; ball-bearing-supported steering bellcranks; a steel, replacement spur gear; and a trick, multi-disk-brake conversion kit.

• **1/8-Scale Truck.** Driving a Kyosho Inferno ST, Tim Long seemed to have a stranglehold on this class. His best time of 12 laps in 5:07.4 placed him handily ahead of second qualifier Carl Giordano (12 laps in 5:25.9). Giordano drove a converted Mugen Athlete, which used tires and wheels from Mugen's Toyota sport truck.

Also using an Inferno ST, and just failing to leap the elusive 12-lap barrier, Thunder Tiger USA's Bill Jeric rounded out the top three with an 11-lap run in 5:01.3.

• **1/10-Scale Truck.** This class, which boasted the

event's second-largest field of 64 entries, was made up primarily of Associated RC10GTs. There were a few A-Main and DuraTrax conversions, and Kyosho debuted several handmade prototypes of a new Rampage Pro. Kris Moore looked as

if he was again the man to beat with his O.S.-powered Kyosho Rampage Pro prototype, but in the fourth round, Pat McCreery's box-stock, O.S. CZ-Z-powered RC10GT edged out Moore by the narrowest of margins (12/5:97 to 12/5:10). Canada's Brian Lavigne, also driving one of the prototype

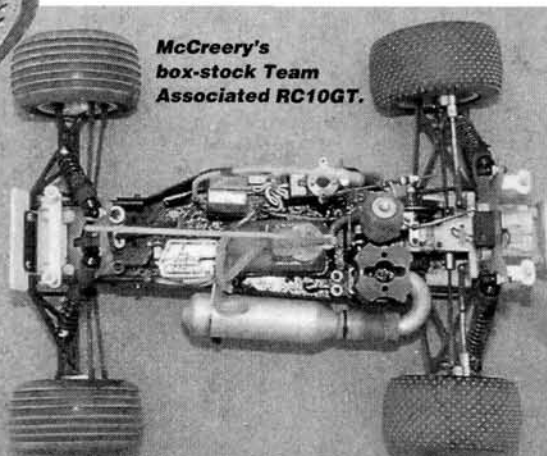
(Continued)

Tim Long's Kyosho Inferno ST.



Kris Moore's new Kyosho Inferno MP-5 buggy.

McCreery's box-stock Team Associated RC10GT.



## 1/8 Truck

Fin.	Qual	Name
1	1	Tim Long
2	2	Carl Giordano
3	4	Robert Brown
4	5	Richard Harding
5	8	Dave Sproul
6	3	Bill Jeric
7	6	Tom Baffer Jr.
8	7	Jerry Lamb

## 1/10 Truck

Fin.	Qual	Name
1	1	Pat McCreery
2	6	Tyrone Wright
3	8	George Weyrauch
4	7	Mike Kendrick
5	9	Dave Iannone Jr.
6	2	Kris Moore
7	5	Ken Sciabaras
8	10	John Roth
9	3	Brian Lavigne
10	4	Darrin Leist

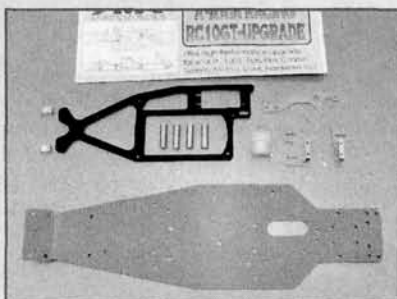
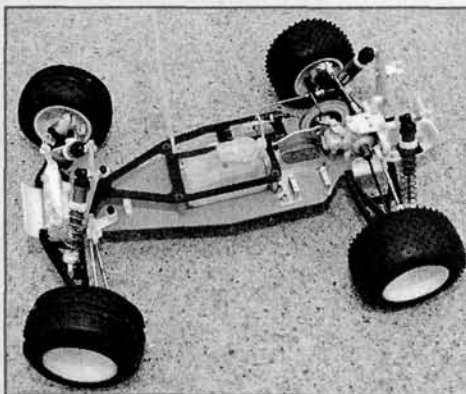
## 1/8 Buggy

Fin.	Qual	Name
1	1	Kris Moore
2	3	Matt Ledger
3	2	Derek Furutani
4	6	Doug Von Mosch
5	4	Dave Henry
6	10	BJ Christensen
7	9	Chris Walrod
8	5	Mike Craddock
9	7	Chris Tosolini
10	8	Peter Head



## A-Main Racing RC10GT Chassis

A-Main Racing's\* Rich Boomsma and Kunio Dudgeon are back with a cool new chassis kit for the popular Associated RC10GT nitro truck. The kit features a hard-anodized, aluminum lower plate with a thick, fiberglass upper plate for strength. A neat, sliding engine-mount system



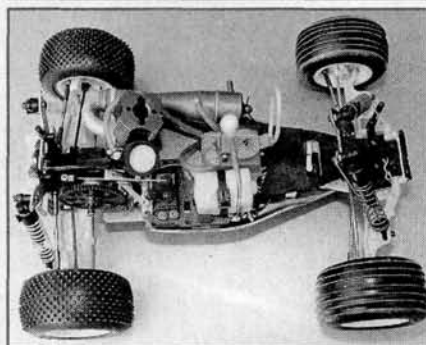
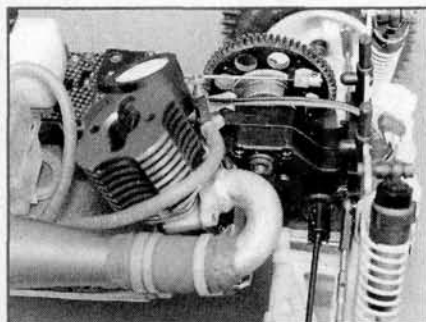
and all the necessary hardware are also included.

A-Main also makes other accessories for the RC10GT, including high-performance clutch shoes and an adapter that lets you use a .21-size air filter with a smaller .12 carb throat.

## On a Rampage

Mikio "Miki-san" Shimizu, section manager, Car Division 1 of Kyosho, Japan, came to Detroit with several handmade prototypes of a new Rampage Pro racing truck. The prototypes feature a new, three-gear transmission with a bottom-mounted ball diff, new rear-arm mounts and a special, rear, shock-tower "shelf" on which the batteries are mounted.

There's no official word on the release date for the updated Rampage Pro, but you should keep your eyes peeled; Kris Moore's prototype turned the fastest laps during the A-Main!



Chassis	Engine	Fuel	Tires	Body	Sponsors
Kyosho	Rex Engines	O'Donnell	Kyosho	Kyosho	Kyosho, O'Donnell, Ultimate Hobbies, Fox Paint
Mugen	Uno	Mu-Juice	Mugen	Mugen	Mugen USA, Bruckner Hobbies
Mugen	Rex Engines	Mu-Juice	Mugen	Mugen	Mugen USA, Ultimate Hobbies, Rex Engines, Waldo Racing
Kyosho	O.S. RG	O'Donnell	Kyosho	Kyosho	Kyosho, O.S. Engines, Team DuraTrax
Kyosho	Thunder Tiger Pro 21	O'Donnell	Kyosho	Parma	Thunder Tiger USA, Kyosho, O'Donnell, Novak
Kyosho	Picco	O'Donnell	Kyosho	Kyosho	Bruckner Hobbies, Kyosho, Hobbico
Mugen	Rex Engines	Mu-Juice	Mugen	N/A	Mugen, Oakley, Rex Engines, Racing Jack, Swollen
Chassis	Engine	Fuel	Tires	Body	Sponsors
Associated	O.S./LTM CZ-Z	O'Donnell	Losi/Pro-Line	Assoc.	Wimpy, Gonzo, LTM Racing, R/C World of Indiana
Traxxas	O.S. CZ-Z	O'Donnell	Pro-Line/Losi	Traxxas	None
Associated	O.S. CZ-R	Blue Thunder	Pro-Line	Assoc.	Hebron Tool & Die, Hobbytown in McHenry IL
Associated	O.S.	Blue Thunder	Losi	Assoc.	Aero-Tec Racing, Grandview Hobbies
Losi conversion	O.S. CZ-Z	Blue Thunder	Losi	Losi	Mitchell's Hobbies
Kyosho	O.S. CZ-R	O'Donnell	Losi	Kyosho	Kyosho, Paris Racing, KO-Propo, Moore's Welding, Fox Paint
Associated	O.S. CZ-Z	Blue Thunder	Pro-Line	Assoc.	Associated/Reedy, Pro-Line, Lunsford, Kimbrough, Mugen, Seir Racing
A-Main/Losi	Thunder Tiger Pro 12	O'Donnell	Losi	N/A	CRC Racing, Mighty Motors, New Wave Batteries
Kyosho	O.S. CZ-Z	O'Donnell	Losi	Kyosho	Kyosho, Hobbico, DuraTrax, O.S. Engine, Pinnacle Hobbies
A-Main/Losi	Thunder Tiger Pro 12	O'Donnell	Losi	Losi	Hobbytown Inc., Thunder Tiger USA, A-Main Racing, R/C Graffics custom paint
Chassis	Engine	Fuel	Tires	Body	Sponsors
Kyosho MP-5	Paris Picco	O'Donnell	Kyosho	Kyosho	Kyosho, Paris Racing, KO-Propo, Moore's Welding, Fox Paint
Mugen	Rex Engines	Mu-Juice	Medial Pro	Mugen	Mugen USA, Rex Engines, Medial Pro, Pro-Line, RCPS, Lunsford, JR-Propo, MIP
Mugen	Rex Engines	Mu-Juice	Medial Pro	Mugen	Mugen USA, Rex Engines, Medial Pro, Lunsford, MIP, SoCal Raceway, Team Losi
Mugen	Rex Engines	Mu-Juice	Medial Pro	Mugen	Mugen USA, Rex Engines, Medial Pro
Kyosho MP-5	O.S. RZ-B	O'Donnell	Kyosho	Kyosho	Kyosho, O.S. Engine, DuraTrax, Hobbico, Pinnacle Hobbies
Mugen	Rex Engines	Mu-Juice	Medial Pro	Mugen	Mugen, MIP, Pro-Line, Team Associated
Mugen	Rex Engines	Mu-Juice	Medial Pro	Mugen	Mugen, Rex Engines, Tekin, Waldo Racing, Moore's Welding
Kyosho MP-5	O.S. RZ-B	O'Donnell	Kyosho	Kyosho	Hobbico, Ripmax, Three 5 Models (UK), Kyosho, O.S. Engine, Fibre Disc Brakes
Mugen	Rex Engines	Mu-Juice	Medial Pro	Mugen	Mugen USA, Rex Engines, Medial Pro, Airtronics, MIP
Kyosho	O.S.	O'Donnell	Kyosho	Kyosho	Kyosho USA, Pinnacle Hobbies



## GAS OFF-ROAD WORLD CHALLENGE

Kyoshos, sealed up the third spot in the A-Main by posting a time of 12 laps in 5:11.9.

### MAIN EVENT SHOWTIME!

• **1/10-Scale Truck A-Main.** At the start of the 15-minute A-Main, Kris Moore's Rampage Pro shot out to a major holeshot, and that left Darrin Leist, Pat McCreery

onto its lid in the infield. This left Giordano with a clear view of the open track, which he promptly used to extend a two-turn lead. Unfortunately, Giordano and the crowd of spectators who lined the track could only watch as Long, who had made short work of Jeric, began to whittle away at Giordano's lead.

Long eventually did get by Giordano, but he flamed-out at the 10-minute mark. When his pit crew had got him back out on the track, he passed both Jeric and Giordano to regain the lead. It's safe to assume that Long was thankful for the 20-minute Main!

Giordano and Jeric's battle for second actually carried them back up to Long, but with less than 4 minutes to go, Jeric flamed-out. Long scooted in for the win with 46 laps in 20:21; Giordano—the only other driver who completed 46 laps—was right on his tail with 20:24.

• **1/8-Scale Buggy A-Main.** At the start of the 30-minute Main, top qualifier Kris Moore and fellow Kyosho driver Mike Craddock somehow placed their MP-5s over the pit wall! Derek Furutani shot out to an awesome-holeshot with Doug Von Mosch and Matt Ledger in tow. For the first 10 minutes of the race, the three Mugsen freight-trained to pull ahead of the pack, but Moore was fighting back from the rear, turning laps nearly 1 second faster than any other car on the

track. Moore wanted this one!

Moore eventually found himself on Ledger's bumper and made a few attempts to pass, but he twice found himself on his lid. But his third attempt was successful, and he began to set his sights on the leaders.

Meanwhile, Furutani and Von Mosch were running close and smooth, but Moore was on a mission. Through excellent pit stops and consistent 22- and 23-second



**The M&W Hobbies trailer had everything you needed to keep your gas buggy or truck running. M&W Hobbies hosted this year's World Challenge.**



**On the drivers' stand, Team Kyosho USA's Kris Moore (middle) concentrates "intently." Sometimes, it seems as though Kris is the only one who remembers that racing is fun!**

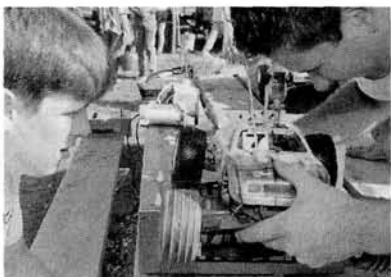
and Brian Lavigne in an intense battle for the second spot. On the eighth lap, mechanical problems sidelined Leist, and on the ninth lap, Lavigne caught the plywood wall in front of the drivers' stand and sheared off his Rampage Pro's right front suspension. This attrition gave McCreery a clear shot at Moore, who had pulled into a comfortable lead.

During the first—and only mandatory—fuel stop, there was some excitement when McCreery temporarily gained the lead as Moore pulled into pit row. For McCreery though, the lead was short-lived, and he handed it back to Moore during his own fuel stop. Eleven minutes into the race, it looked as if Moore would breeze to an easy victory, but alas, the R/C gremlins had their way, and his Rampage Pro was pulled off the track with a broken steering servo. At the horn, McCreery's RC10GT crossed the line first with 35 laps in 15:08, followed by Tyrone Wright with 34 laps in 15:20.

• **1/8-Scale Truck A-Main.** Tim Long holeshotted ahead of Bill Jeric and Carl Giordano, but then he put his Inferno ST



**Mike Craddock came all the way from Britain to compete in the World Challenge. He says it's hard for him to adjust to American tracks because he usually races on grass. Despite this, his precise driving netted him an A-Main finish in the Buggy division.**



**Two of "da Bruckner boys" (Tom Baffer Jr. and Carl Giordano) thrash on a teammate's nitro truck.**



**Mikio Shimizu (left) works for Kyosho in Japan, and he made the long flight to see how his prototype Rampage Pro trucks would fare on the tough Freedom Hill track.**

### SEE YOU AT NUMBER SIX

Intermediate to expert hobbyists should give nitro off-road racing a serious look. Everyone at the World Challenge seemed to have a good time, and very few racers had mechanical difficulties. Overall, the fifth annual World Challenge was a complete success, with much of the credit going to the Top of the Hill R/C Club, which did an excellent job of running the event.

Thanks go to race director Bill Drew, scorekeeper Todd Drew and to announcer Mike "Kahuna" Navaira. Wilson Tang of M&W Hobbies, which hosted the World Challenge, also deserves a round of applause. Last, but certainly not least, thanks to Mugen and Bruckner Hobbies for their co-sponsorship, without which the World Challenge would have been less spectacular.

\*Addresses are listed alphabetically in the Index of Manufacturers on page 264.



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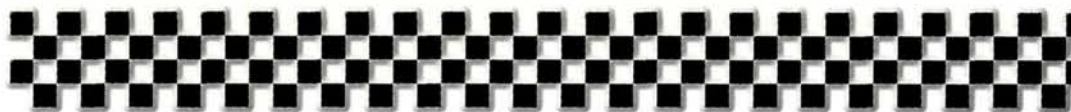
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If an item in this guide is preceded by a "•"  
it is a new item to this issue.  
If the price is preceded by a "+" or "-" it has new  
pricing that has either gone up or down  
according to the symbol used.





**STOCK  
MOTORS**



## ROAR LEGAL STOCK MOTORS

All ROAR legal stock motors are built to a set of technical specifications established by ROAR. To be legal to race at ROAR sanctioned events, a manufacturer's stock motor must meet all of ROAR's specifications. These rules were drawn up to make stock class racing as fair and even as possible. If you are attending a ROAR rules stock class race, these are the motors you will need to run. 27 Turns, 24 Degree Maximum Timing, 22 Awg Wire, 64" Minimum of Wire.



Part #	Name	Price	Turns	Can Color	Timing Degree	Brush Type	Magnets Type	Holes In Can	Thickness Of Can	Brush Part #	Spring Part #	Special Features	Free RPM At 6 Volts
RC2095	Midnight	•\$39.99	27	Blk	24	Laydown	5.2	2 Hole	1.3	4080	4387	Short Stack	24,300
RC2096	Midnight Reverse	•\$39.99	27	Blk	24	Laydown	5.2	2 Hole	1.3	4080	4387	Short Stack	24,300
RC2028	Legends	\$27.95	27	Sil	24	Standard	4.9	Solid	1.2	4495	4532	Low Cost	17,650

### TRINITY

### SPEEDWORKS

9424	Green Machine 2	-\$32.00	27	Grn	24	Laydown	5.1	3 Hole	1.2	4080	4387	Tri-Rotor	23,800
9425	Green Machine 2 Rev.	-\$32.00	27	Grn	24	Laydown	5.1	3 Hole	1.2	4080	4531	Reverse	23,800

## OUTLAW STOCK MOTORS

Many areas of the country do not follow ROAR rules for their stock class motors. These tracks use "list price and bushings" to determine whether a motor is legal for stock racing or not. If this is how you race, or if you simply wish to have a stock motor that is faster than the ROAR legal types for street racing, look at the models below. If you race in the NORRCA Expert Stock Class or by "Street Spec" rules or just need more horsepower for your Tamiya car you need to try the models below.

RC2097	Monster Stock Jr 3	•\$39.99	27	Pnk	30	Laydown	5.2	2 Hole	1.3	4475	4387	NORRCA	27,200
SS2228	Street Spec	+•\$29.95	21	Sil	21	Standard	5.0	Solid	1.2	4495	4387	Street Spec	20,850

## MIDNIGHT STOCK FEATURES NEW TECHNOLOGY

Right...Midnight is the first Trinity stock motor to feature a short slotted armature and still maintain ROAR legality. This is possible due to the use of aluminum heatsinks on the top and bottom of the armature blank. Winding 27 turns of wire over the heatsinks, makes the wire's length meet the ROAR rules. The heatsinks conduct heat away from the armatures core and out into the cooler air circulation through the motor can.

The center slot in the armature stack allows for better cooling of the wire, and redistributes the magnetic field pattern of the armature blank.

Midnight's short armature has less metal and is therefore lighter than other stock armatures. This makes it accelerate quicker to a higher rpm than can be accomplished with any other stock armature presently made today. This is stock motor technology taken to the limits of the ROAR rules.

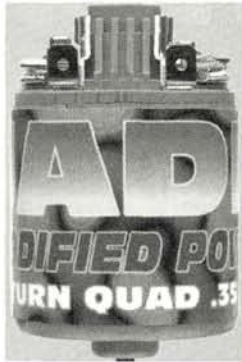
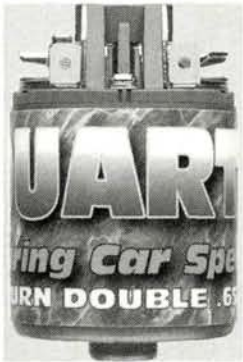
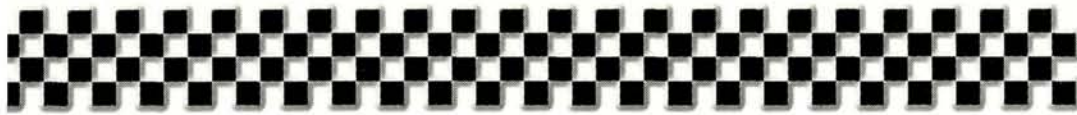


Left...A special new reduced surface area bushing cuts shaft to bushing contact area by 25%. This results in less drag and more rpm's. Bushing design also lets the bushing break in quicker for a faster motor right out of the box.

Right...The Midnight's 1.3mm thick motor can features the same super strong 5.2 wet magnets as used in the Team Kinwald modified motor line. The use of a short armature stack requires a strong magnetic field to work properly. The thick motor can and Internal Magnetic Flux Collector™ all work in unison to balance the magnetic field by reducing flux loss on the open endbell side of the can. Cooling tunnels let air enter from the sides even when the motor is mounted in a car!







## **SPEED GEMS '96 MODIFIED MOTORS**

Machine wound modified motors are a great alternative if you are a racer on a budget. If you are looking for a taste of modified racing, or just want the fastest meanest machine on the block, look no further. We have all the horsepower you could possibly want at the best price. What you need is a Speedworks Speed Gem modified motor, or if you just run off-road the Team Kinwald Buggyweld modified motor.

The machine wound modified motors use all the best components like the more expensive modifieds, but they have machine wound armatures. What you do get for your money is a very fast motor at just about 1/2 the cost. Many racers we know who use the more expensive hand wound motors will use one of our

Speed Gems to practice with, tune their car, and as a back-up in case they have problems with their primary motor. They say the performance is so close to that of their race motors that they are able to save their more expensive motors just for serious racing. Then of course there are those which just use the machine wound motors with great success in all forms of racing.

New this year in the Speed Gems line are 2 new modifieds; the Quartz and the Jade. The Quartz is a 19 turn which was designed especially for Touring cars and for longer run times. The Quartz is excellent for slippery buggy tracks where hooking up a car is a problem. The smooth power curve of the Quartz will allow you to put all of its horsepower to the ground.

The Jade is a 15 turn motor which falls right in the center of the Speed Gems motor line. This is one of the most popular winds due to its excellent speed and run time with 1700 SCRC cells. The Jade is your best buy if you can only afford one modified motor as it will run well in most types of racing.

Part #	Name	Price	Turns	Wind	Timing	Brush	Magnets	Holes	Thickness	Brush	Spring	Suggested	Free RPM
					Degree	Type	Type	In Can	Of Can	Part #	Part #	Usage	At 6 Volts

### **KINWALD MACHINE WOUND MODIFIED MOTOR WITH BALL BEARINGS**

TK2018	BuggyWald	\$49.99	13	2	Adj	Standard	5.1	Solid	1.2	4495	4531	2wd Off-Road Buggy	31,300
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### **SPEEDWORKS SPEED GEMS MACHINE WOUND MODIFIED MOTORS WITH BALL BEARINGS**

9200	Topaz	\$49.99	11	3	Adj	Standard	5.1	Solid	1.2	4495	4531	4wd Buggy/1/10 Oval	36,750
9201	Ruby	\$49.99	16	3	Adj	Standard	5.1	Solid	1.2	4495	4531	2wd Trucks/Buggys	25,600
9202	Sapphire	\$49.99	17	1	Adj	Standard	5.1	Solid	1.2	4495	4531	Monster Truck/Planes Boats	24,150
9203	Diamond	\$49.99	12	2	Adj	Standard	5.1	Solid	1.2	4495	4531	1/10th On-Road/Oval	33,750
9204	Onyx	\$49.99	14	2	Adj	Standard	5.1	Solid	1.2	4495	4531	2wd Trucks/Buggys	29,100
9206	Jade	•\$49.99	15	4	Adj	Standard	5.1	Solid	1.2	4495	4531	2wd Trucks	27,060
9207	Quartz	•\$49.99	19	2	Adj	Standard	5.1	Solid	1.2	4495	4531	Touring/F1, Planes, Boats	21,540

### **OUTLAW OVAL HIGH PERFORMANCE MOTOR**

Replacement motor for the BRP Outlaw Oval Cars. Higher Performance, more speed, rebuildable.

RC2029	Outlaw Oval	\$12.25	70	1	Fixed	16-D	16-D1 Hole					BRP Outlaw Oval Cars	12,500
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RC2031	Replacement Brushes and Springs for Outlaw Oval Motors	•\$2.69											
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**PICK THE RIGHT MOTOR BRUSHES FOR YOUR TYPE OF MOTOR & RACING, SEE PAGE 10**





**EPOXY  
BALANCED  
MODIFIEDS**



## TRINITY EPOXY BALANCED HAND WOUND MODIFIED MOTORS

Epoxy balancing is the latest technology pioneered by Trinity for high performance electric R/C motors. Instead of drilling holes in the heavy portion of the armature, epoxy weighted material is applied at the light portion of the armature to counter-balance the heavy side. The result? Perfectly balanced, but no holes.

This technique eliminates damage to the armature pole pieces that drilling may cause and helps preserve the saturation balance of the armatures segments. Maintaining the armature magnetic mass balance can be a real performance advantage. In addition Eddy Current and Hysteresis losses and corresponding heating will be reduced because the armatures laminations are no longer drilled.

When drilling an armature, it is very unlikely all poles will wind up with the same size holes. Once the armature is finally balanced, holes of varying sizes will exist in the different pole pieces. The result will be equal physical mass, but unequal magnetic mass for each of the poles. Not only will the pole to pole magnetic mass be different but the total magnetic mass will be reduced. This is important, as the total magnetic mass of the armature is significant to the amount of power the motor is ultimately capable of producing. The end result of epoxy balancing is a higher power, cooler running modified motor.



Part #	Name	Price	Turns	Wind	Timing	Brush	Magnets	Holes	Thickness	Brush	Spring	Suggested	Free RPM
					Degree	Type	Type	In Can	Of Can	Part #	Part #	Usage	At 6 Volts

### TEAM KINWALD DIRTINATOR EPOXY BALANCED MODIFIEDS, DEVELOPED FOR OFF-ROAD USE

KD0509	Dirtinator 9	•\$95.00	9	5	Adj	Standard	5.2	Solid	1.3	4380	4033	4wd, High Traction Tracks	47,750
KD0410	Dirtinator 10	•\$95.00	10	4	Adj	Standard	5.2	Solid	1.3	4380	4033	2wd, High Traction Tracks	43,691
KD0411	Dirtinator 11	•\$95.00	11	4	Adj	Standard	5.2	Solid	1.3	4380	4033	4wd Most Tracks	40,025
KD0312	Dirtinator 12	•\$95.00	12	3	Adj	Standard	5.2	Solid	1.3	4380	4033	2wd Most Tracks	35,717
KD0313	Dirtinator 13	•\$95.00	13	3	Adj	Standard	5.2	Solid	1.3	4380	4033	4wd Big or Slippery Tracks	32,750
KD0214	Dirtinator 14	•\$95.00	14	2	Adj	Standard	5.2	Solid	1.3	4380	4033	2wd Big or Slippery Tracks	29,652
KD0215	Dirtinator 15	•\$95.00	15	2	Adj	Standard	5.2	Solid	1.3	4380	4033	2wd Very low Traction Tracks	28,334

### TRINITY TEAM EDITION '96 EPOXY BALANCED MODIFIEDS DEVELOPED FOR ON-ROAD USE

TE0107	Team 7T	•\$95.00	7	1	Adj	Standard	5.2	Solid	1.3	4380	4492	Drags/Speed Runs/Pulling	56,972
TE0108	Team 8T	•\$95.00	8	1	Adj	Standard	5.2	Solid	1.3	4380	4492	Drags/Speed Runs/Pulling	51,275
TE0311	Team 11T	•\$95.00	11	3	Adj	Standard	5.2	Solid	1.3	4380	4033	1/10th On-Road	38,554
TE0512	Team 12T	•\$95.00	12	5	Adj	Standard	5.2	Solid	1.3	4383	4032	Paved Ovals-Small Tracks	37,391
TE0413	Team 13T	•\$95.00	13	4	Adj	Standard	5.2	Solid	1.3	4383	4032	Big Ovals/Velodromes	32,747
TE0314	Team 14T	•\$95.00	14	3	Adj	Standard	5.2	Solid	1.3	4525	4534	1/12th On-Road 4 Cell	30,685
TE0216	Team 16T	•\$95.00	16	2	Adj	Standard	5.2	Solid	1.3	4380	4028	1/12th On-Road Asphalt	26,537
TE3317	Team 17T	•\$95.00	17	3	Adj	Standard	5.2	Solid	1.3	4383	4032	1/12th On-Road Asphalt	24,990
TE3318	Team 18T	•\$95.00	18	3	Adj	Standard	5.2	Solid	1.3	4383	4032	1/12th On-Road Asphalt	23,574

### TRINITY TEAM EDITION '96 \*RARE EARTH EPOXY BALANCED MOTORS

RE0108	Rare Earth 8	•\$229.00	8	1	Adj	Standard	RE*	Solid	1.2	4383	4492	Drag Racing 6 Cell	58,100
RE0109	Rare Earth 9	•\$229.00	9	1	Adj	Standard	RE*	Solid	1.2	4383	4492	Drag Racing 6-8 Cell	52,500
RE0110	Rare Earth 10	•\$229.00	10	1	Adj	Standard	RE*	Solid	1.2	4383	4492	Oval Racing	46,300
RE0211	Rare Earth 11	•\$229.00	11	2	Adj	Standard	RE*	Solid	1.2	4383	4492	Oval Racing 6-12 Cells	42,000
RE0212	Rare Earth 12	•\$229.00	12	2	Adj	Standard	RE*	Solid	1.2	4383	4492	1/10th On-Road	36,500

The Rare Earth Motors use a special extra strong Rare Earth magnet. This allows these motors to produce more power than a motor with standard 5.0 or 5.2 wet magnets. The Rare Earth magnets allow these motors to run with battery packs bigger than 7 cells. These Rare Earth motors are not ROAR or NORRCA legal, but they are for legal certain classes of Drag Racing, Pulling, Speedruns, Airplanes and Boats.



## TEAM KINWALD OFF-ROAD MODIFIED MOTORS

We still offer our most popular Team Kinwald Modified motors. These feature the gray Kinwald motor set-up and standard balanced armatures.

TK1011	Kinwald 11	-\$85.00	11	3	Adj	Standard	5.2	Solid	1.3	4380	4033	2wd High Bite Tracks	38,300
TK1012	Kinwald 12	-\$85.00	12	2	Adj	Standard	5.2	Solid	1.3	4380	4033	2wd-4wd Buggys	35,250
TK1013	Kinwald 13	-\$85.00	13	1	Adj	Standard	5.2	Solid	1.3	4380	4033	Racing Trucks	32,500
TK1014	Kinwald 14	-\$85.00	14	2	Adj	Standard	5.2	Solid	1.3	4380	4033	Racing Trucks	30,150
TK1015	Kinwald 15	-\$85.00	15	3	Adj	Standard	5.2	Solid	1.3	4380	4033	2wd-Slippery Track	28,100



## SAMARIUM COBALT HIGH PERFORMANCE RACING MOTORS

When it comes to producing unlimited racing motors, no one does it better than Trinity. These new motors were designed around real Samarium Cobalt magnets. Samarium Cobalt is one of the strongest magnet materials available. This magnet material allowed us to manufacture the magnets much thinner, without sacrificing the integrity of the magnetic field. The can was then machined, not stamped, to fit the magnets perfectly. The wall thickness of the can is thicker in the areas of magnetic flow for a stronger field and less flux loss. These motors are smaller and lighter in weight than a standard .05 motor. The armature features a tied commutator, and high temperature high strength epoxy to hold the wires in place. The best part yet is it uses the Trinity armatures you already have in your box. The 12 and 13 turn motors work very well in airplanes and boats.

Part #	Name	Price	Turns	Wind	Timing Degree	Brush Type	Magnets Type	Holes In Can	Thickness Of Can	Brush Part #	Spring Part #	Features	Free RPM At 6 Volts
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### TRINITY

RC1005	Dragworks Motor	\$275.00	8	1	Adj	Standard	2.3	Billet	1.6	4383	4492	Machined Can	59,550
RC1006	Dragworks Motor	\$275.00	9	1	Adj	Standard	2.3	Billet	1.6	4383	4492	MachinedCan	53,050
RC1008	Dragworks Motor	\$275.00	10	1	Adj	Standard	2.3	Billet	1.6	4383	4492	MachinedCan	47,350
RC1009	Dragworks Motor	\$275.00	11	1	Adj	Standard	2.3	Billet	1.6	4383	4492	Machined Can	42,250
RC1010	Dragworks Motor	\$275.00	12	2	Adj	Standard	2.3	Billet	1.6	4383	4492	MachinedCan	37,650
RC1011	Dragworks Motor	\$275.00	13	2	Adj	Standard	2.3	Billet	1.6	4383	4492	MachinedCan	33,700

## EPOXY BALANCED ARMATURES

All Trinity armatures are hand wound using the highest grade 100% pure copper wire for the least possible internal resistance. The armature wires are then epoxied with a high temperature high tensile strength aerospace adhesive to make sure they stay in place even at the highest RPM. After the epoxing process, the commutator is diamond trued to .0001 and the armature is epoxy balanced to eliminate any vibration. By epoxy balancing we eliminate the drilling of any holes into the armature. This keeps the magnetic field of all the poles in balance as there



are no "Dead Spots" where the laminations are shorted together at the drill holes. We then package the armature in a plastic tube to keep the commutator safe from any damage until you can put it into one of your motor set-ups. Remember all armatures can be used in any standard RC motor sold by Trinity, Speedworks, Pointblank, Maxtec, Extreme, Peak Performance, Fantom, Cam, Reedy, etc..

Remember when picking out an armature:

1. The lower the turns the higher the RPM 's but shorter the battery life.
2. The higher turn motors have the longest battery life, and the smoothest response.
3. Gear low turn motors with small pinions to get low end torque and run time.
4. Gear high turn motors with big pinions to get top end speed, as battery life is usually not a problem.
5. The better your battery pack the lower number of turns you can use.

Turn page for a complete listing of replacement armatures....

**TRINITY**





## EPOXY BALANCED ARMATURES

These arms are all wound with the highest "Circular Mills" possible and are recommended for serious racers only. They will fit all EX-Tech, Team Kinwald, Trinity, Rare Earth, Speedworks, and modified motors by all the major motor builders like Cam, Reedy, Peak Performance, Extreme, etc.. These armatures can be used for any type racing depending on the track, your battery pack and driving style. We have listed the motors that these winds come standard in where applicable.

The wind is determined by counting the strands of wire used. A 24,24,24,24,24, is 5 strands of 24 Awg wire, therefore it is a quint wind. 18,18.5 would be a double wind one strand of 18 and one strand of 18.5 Awg wire..

Part#	Turns	Wind & Wire Gauge	Motor Used In
DA0209	09	18,18.5	•\$49.99
DA0509	09	24,24,24,24,24	KD0509 •\$49.99
DA0310	10	20,20,21	•\$49.99
DA0410	10	21,22,22,22	KD0410 •\$49.99
DA0211	11	18.5,19	•\$49.99
DA0411	11	21,22,22,23	KD0411 •\$49.99
DA0511	11	22,22,23,23,23.5	•\$49.99
DA0212	12	19,19.5	•\$49.99
DA0312	12	20.5,21,22	KD0312 •\$49.99
DA0412	12	22,22,22,22	•\$49.99
DA0612	12	23.5,23.5,24,24,24,24	•\$49.99
DA0113	13	16.5	•\$49.99
DA0213	13	19,19.5	•\$49.99
DA0313	13	21,21.5,22	KD0313 •\$49.99
DA0513	13	23,23,23,24,24	•\$49.99
DA0114	14	17	•\$49.99
DA0214	14	20,20	KD0214 •\$49.99
DA0314	14	21,22,22.5	•\$49.99
DA0514	14	23.5, 23.5, 23.5, 24, 24	•\$49.99
DA0215	15	20,20.5	KD0215 •\$49.99
DA0315	15	22,22,22	•\$49.99
DA0415	15	23,23,23.5,24	•\$49.99
DA0316	16	21.5,22.5,23	•\$49.99
DA0417	17	23,23.5,24,25	•\$49.99
DA0219	19	21,21.5	•\$49.99
DA0221	21	21.5,22	•\$49.99
DA0223	23	23,23	•\$49.99
TA0107	7	15	TE0107 •\$49.99
TA0108	8	15	TE0108 •\$49.99
TA0311	11	20,21,21.5	TE0311 •\$49.99
TA0512	12	23,23,23,23,23	TE0512 •\$49.99
TA0413	13	21.5,22,23,23.5	TE0413 •\$49.99
TA0314	14	21,22,22.5	TE0314 •\$49.99
TA0216	16	20,21	TA0216 •\$49.99
TA0317	17	22.5,22.5,23	TA0317 •\$49.99
TA0318	18	22,23,23.5	TA0318 •\$49.99



## EPOXY BALANCED ARMATURES FOR RARE EARTH/COLBALT MOTORS

These high performance armatures come with tied commutators and a double coating of epoxy to keep the wires and commutator intact when running more than 7 cells. These armatures fit all Team Kinwald, Ex-Tech, Cobalt and Rare Earth modified motors.

Part#	Turns	Wind & Wire Gauge	Motor Used In
DA108	8	15	RE0108, RC1005 •\$59.00
DA109	9	15.5	RE0109, RC1006 •\$59.00
DA110	10	15.5	RE0110, RC1008 •\$55.00
DA111	11	16	RE0211, RC1009 •\$55.00
DA112	12	19,19.5	RE0212, RC1010 •\$55.00
DA113	13	16.5	RC1011 •\$55.00

## CUSTOM WOUND ARMATURES

We will process your own personal "secret" race wind. All custom wound armatures require a 21 day turn around time. All orders must be prepaid when placing the order. When ordering be sure to specify wire gauge and number of turns. All armatures will be wound on EX-Tech armature blanks.

RC3991	Custom Armature, epoxy balanced	+\$55.00
RC3992	Custom Armature, epoxy balancedw/tied comm	+\$60.00

## WIND YOUR OWN ARMATURES

Blank armatures so that you can wind them yourself.

RC4101	EX-Tech Armature Blank, without wire	\$16.95
RC4454	Tri-Rotor Armature Blank without wire	\$15.95

## ARMATURES FOR SPECIALITY APPLICATIONS

A125BC	25 Single Turbo Dyno Slave Motor Arm	\$40.00
A190	12 Volt Comm Lathe Motor Arm	\$40.00



**NO MATTER HOW  
GOOD YOUR MOTOR  
IS, IT CAN ONLY  
RUN AS FAST AS  
THE BATTERY THAT POWERS  
IT ALLOWS IT TO. FOR THE  
BEST BATTERIES IN R/C TURN  
TO PAGE...11**

**TRINITY**



## REPLACEMENT MOTOR PARTS

### TEAM KINWALD

TK1016	Team Kinwald Motor Setup, gray	+\$55.00
TK1001	Team Kinwald Endbell, gray style	-\$25.99
TK1002	Team Kinwald Motor Can, gray style	+\$34.99
TK1003	Team Kinwald Timing Ring w/ screws fits all	+\$2.49
TK2010	Dirtinator Motor Setup, black	•\$55.00
TK2011	Dirtinator Endbell, standard brushes	•\$25.99
TK2012	Dirtinator Motor Can, black style	•\$34.99

### EX-TECH, SPEED GEMS

RC4472	Complete EX-Tech Motor Setup, gray	+\$48.99
RC4473	EX-Tech Motor Can, gray no holes	+\$27.00
RC4474	EX-Tech Motor Can, gray with 3 holes	+\$29.00
RC4506	EX-Tech Endbell, standard brushes	+\$24.50
RC4507	EX-Tech Endbell, laydown brushes	\$25.00

### TRINITY

Fits All EX-Tech, Dirtinator and Team Kinwald

RC4027	Brass Motor Shims, 10 pieces	\$2.25
RC4027B	Brass Motor Shims, 100 pieces	\$9.99
RC4029	Phenolic Motor Shims, 12 pieces	\$1.99
RC4029B	Phenolic Motor Shims, 100 pieces	\$14.99
RC4031	Modified Motor Ball Bearing, can/endbell	+\$8.25
RC4095	Midnight Recessed Bushing, all stock motors 2 pc	•\$1.59
RC4470	Laydown Brush Hoods, w/screws & posts	\$6.99
RC4530	Silver Threaded Spring Posts 1 pair	\$2.49
RC4533	Motor Rebuild Kit, screws	\$2.49

Comes with a steel timing ring, 2 timing ring screws, 2 brush screws and 2 oversized screws for stripped out brush screw holes.

### DRAGWORKS

RC1007	Cobalt Motor Set-up, mini can fits std. arm	\$225.00
RC1012	Rare Earth Drag Motor Setup, .05 sized	•\$159.00
RC1013	Rare Earth Magnets, fits .05 motor can	•\$99.99

## MOTOR ACCESSORIES

RC4485	Laydown Stock Tuning Kit, 2 pr Brush 3 pr Spring	•\$11.99
RC4102	Motor Sleeve, slips over can more torque	\$4.99
RC4012	Short Motor Mounting Screws	\$1.00
RC4013	Long Motor Mounting Screws	\$1.00
RC4043	Motor Spacer Heatsink, fits between can and mount	\$7.99
RC4050	Commutator Cleaning Sticks, 2 compounds	\$9.99
RC4060	Commutator Cleaning Stick, std/laydown brush	\$5.29
RC4061	Commutator Polishing Stick, std/laydown brush	\$5.29
RC4451	Small Motor Can Heatsink, on-road cars	\$21.99
RC4452	Large Motor Can Heatsink, off-road cars	\$23.99
RC4528	Spring Post Wrench, unscrews spring posts	•\$9.99
RC7913	Brush Hood Alignment Tool	\$10.99



## MOTOR CAPACITORS

RC4009	Disc Capacitors, 6 pieces	-\$1.00
RC4450	High Frequency Capacitors	-\$1.49



## MOTOR SPRINGS

RC4032S	Light Tension, chrome (1 pr.)	\$2.39
RC4032	Same As Above, But 6 Pair	\$12.00
RC4028S	Medium Tension, gold (1 pr.)	\$2.39
RC4028	Same As Above, But 6 Pair	\$12.00
RC4033S	Heavy Tension, silver (1 pr.)	\$2.39
RC4033	Same As Above, But 6 Pair	\$12.00
RC4492	Extra Heavy, black (1 pr.)	\$2.39
RC4493	Same As Above, But 6 Pair	\$12.00
RC4445	Spring Tuning Kit, light, med & heavy	\$6.50
RC4387	Black-Tech Spring For Laydown Brushes	+\$2.50
RC4388	Same As Above But 6 pair	\$12.79
RC4531	Stock Motor Springs, .05 x 150°, 6 pr.	\$12.00
RC4532	Same As Above, but single pair	\$2.39
RC4534	Stock Teardown Spring, gold (1 pr)	•\$2.39
RC4535	Same As Above, But 6 Pair	•\$12.00

## THE GOLD DUST TWINS! HODAPP-KINWALD



Greg Hodapp joins IFMAR Off-Road World Champion Brian Kinwald as a member of the Trinity off-road racing team. Greg is one of the best off-road racers around and he is the current NORRCA National Champion! This now gives Trinity a deadly powerful one, two punch at all off-road races.

## JACK ATTACK!

Also racing again for Team Trinity is Jack "The Jack Hammer" Johnson. Jack has not been running much in the past year or so but his magnificent performance at the IFMAR Off-Road World Championships in Japan showed he is definitely back in form.

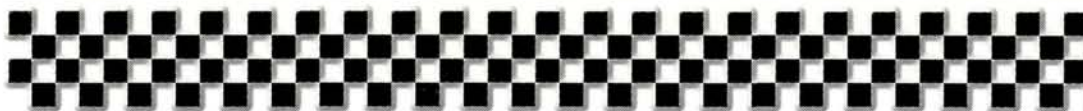


# TRINITY





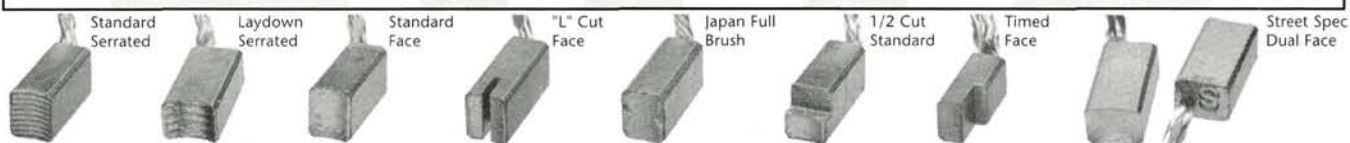
**MOTOR  
BRUSHES**



### BRUSH COMPOUND

### SPECIAL FEATURES

Part #	Product Name	Price	Alloy	Grade	Density	Type	Face	Cut	Shunt Type	Common Use
RC4065	Sportsman Hard	1.50	Copper	CU-8	Hard	Standard	Standard	None	Single	B,R,A
•RC4070	Serrated Laydown Silver	3.50	Silver	AG-9	Hard	Laydown	Serrated	"L" Slot	Single w/Terminal	S,O,D,B,W
RC4075	Timed Silver Serrated	5.00	Silver	AG-9	Hard	Laydown	Serrated	Timed	Single/Terminal	S
•RC4080	Serrated Laydown Hard	3.50	Copper	CU-8	Hard	Laydown	Serrated	"L" Slot	Single w/Terminal	B,R,S,W
RC4085	Timed Hard Serrated	5.00	Copper	CU-8	Hard	Laydown	Serrated	Timed	Single w/Terminal	S
RC4380	Serrated Hard	3.50	Copper	CU-8	Hard	Standard	Serrated	None	Single w/Terminal	S,R,B,T
RC4383	Serrated Silver	3.50	Silver	AG-9	Hard	Standard	Serrated	None	Single w/Terminal	O,S,R,B,T
RC4385	"L" Slot Sport Silver	3.75	Silver	AG-9	Hard	Standard	Standard	"L" Slot	Single	O,S,T,R
RC4460	AG-9 Sportsman Silver	1.50	Silver	AG-9	Hard	Standard	Standard	None	Single	O,R,B,T
RC4476	Timed Soft	4.00	Copper	CU-1	Soft	Standard	Standard	Timed	Double w/Terminal	L,A,S
RC4475	Stock Japan Laydown	1.00	Copper	CU-2	Med Soft	Laydown	Standard	None	Single w/Terminal	S,B,A
•RC4495	Stock Japan Full Brush	1.00	Copper	CU-2	Med Soft	Standard	Standard	None	Single w/Terminal	S,B,A
RC4525	1/2 Cut Sport Silver	3.75	Silver	AG-9	Hard	Standard	Standard	1/2 Cut	Single	O,T,S
•SS2229	Street Spec	2.99	Copper	CU-4	Medium	Dual	Standard	None	S-Single w/Terminal	SS,H,L,S,A,T



### COMPOUND

**Alloy:** Silver = Highest Performance, Requires more maintenance, Copper = Excellent Performance, Less routine maintenance.

**Grade:** AG-9, Silver compound, makes the most power. Excellent for most racing applications, Not for play! Serious Racing only!  
CU-8, Hard Copper compound with excellent life and power. Good for serious racing and practice.  
CU-4, Street Spec compound. Equalizes stock motor performance. Special shunt and molded "S" makes tech easy!  
CU-2, All purpose compound that comes stock with some motors. Easy on commutator. Good power!  
CU-1, Soft compound that requires little maintenance to commutator. Easy on comms, good on high voltage as in planes!

**Density:** Indicates the relative hardness of the brush compounds and their effect on the commutator.  
Hard = Higher performance, but more wear, Soft = Slightly less performance, but less commutator wear.

### TYPE

**Standard:** Regular stand-up brush. Radius molded along the longest length of the face.

**Laydown:** Brush is rotated 90 degrees from standard. Radius molded along shortest length of the face. Needs laydown brush hoods.

**Dual:** Featured on the Street Spec brush, this face was designed to work in either a standard or laydown brush motor.

### FACE

**Serrated:** Small grooves in the face of the brush lets it break in instantly. Makes outstanding power. Excellent for stock and modified motors.

**Standard:** Smooth full face. Normal radius.

### CUT

**Timed:** For stock motors only. Increases the effective timing by offsetting the brush surface where it contacts the commutator.

**1/2 Cut:** 1/2 the brush face is cut away so that the brush is only 1/2 the height on the commutator. Less drag. Great for oval.

**"L" Slot:** A thin slot is cut down the center of the brush face. Improves brush alignment, speeds break in and cleans brush track.

### SHUNT

**Single:** One molded in shunt of Silver plated Copper with or without terminal for screwdriver assembly.

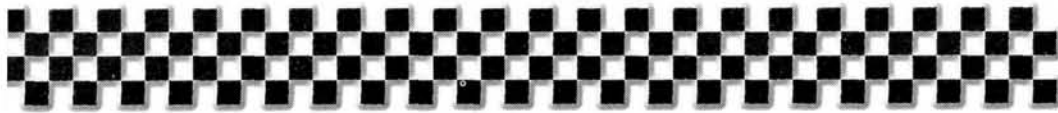
**S-Single:** Street Spec 4 x 4 shunt. Copper and silver colored to make identification easy. Comes only with terminal.

**Double:** 2 molded in shunts of Silver plated Copper. Less resistance. Comes with terminal.

### USES

"O" = Oval Racing, "S" = Stock Motors, "D" = Drag Racing, "W" = Boats, "A" = Airplanes, "SS" = Street Spec, "L" = Legends  
"B" = Buggy/Truck, "R" = On-Road racing 1/10th 4/5 min, "T" = On-Road 1/12th 8 min, "H" = Handout Brush/Motor Events



**MATCHED  
BATTERIES**

## **BATTERIES, MATCHED TRINITY EX-TECH**

Trinity has incorporated a new "pre-staging" application for all of our matched cells. This allows us to recognize the "good cells" at each level. The levels we have chosen reflect the needs and usage the batteries will receive. We use amp loads which closely mimic the end users requirements. For instance most Sport-Tech battery users will be running stock motors and racing in the entry level classes. We would never need cells that perform best at a 27 amp load. Just like the weekly modified racer would have little use for a Sport-Tech pack when 27 amp World-Tech cells are available.



Trinity now tests at 3 different levels (Tier system). All cells are initially tested at the Sport Level, then move to the Race level and then on to the World level. This allows us more chances to "screen" for bad or weakening cells.

Sanyo Sport-Tech Cells are discharged at 20 amps, charged at 6 amps and use a voltage cut-off of .90. Race-Tech Cells are discharged at 25 amps, charged at 5 amps and use a voltage cut-off of .90. World-Tech 30 Cells are discharged at 30 amps, charged at 4 amps and use a voltage cut-off of .85. At 30 amps discharging to .85 volts instead of .90 volts gives a more accurate indication of when the battery dumps and gives the battery pack a better match for 4-minute racing. Discharging at a lower rate in the early stages of cell testing (Sport-Tech) should enhance the overall life of the cells, unlike the current process adapted by everyone to "hit" the cells hard (27 to 30 amps) to identify the "killer cells".

Although Trinity uses its own "proprietary" pre-staging and cycling equipment that allows us to cycle many more cells than our competitors thus enhancing your chances of receiving good cells; we use the race-proven "Competition Electronics Turbomatchers" in our final test stages.

According to Competition Electronics, Trinity is the "ONLY" company which rotates their matchers for recalibration on an ongoing basis. This should be most important to you "our customer" so you have the confidence the data being reported on your battery labels is completely ACCURATE.

**WORLD-TECH  
NOW DISCHARGED AT  
30 AMPS!**

### **SANYO 1400 CELLS**

Charge Rate: 6.0A	Voltage Cutoff: .90V	
EXS144	20 Amp Sport-Tech 4 Cell 1400 SCR	+\$30.99
EXS146	20 Amp Sport-Tech 6 Cell 1400 SCR	+\$45.25
EXS147	20 Amp Sport-Tech 7 Cell 1400 SCR	+\$53.25
Charge Rate: 5.0A	Voltage Cutoff: .90V	
EXR144	25 Amp Race-Tech 4 Cell 1400 SCR	+\$40.75
EXR146	25 Amp Race-Tech 6 Cell 1400 SCR	+\$60.75
EXR147	25 Amp Race-Tech 7 Cell 1400 SCR	+\$71.25
Charge Rate: 4.0A	Voltage Cutoff: .85V	
EXW344	30 Amp World-Tech30 4 Cell 1400 SCR	•\$53.75
EXW346	30 Amp World-Tech30 6 Cell 1400 SCR	•\$80.75
EXW347	30 Amp World-Tech30 7 Cell 1400 SCR	•\$95.50

### **SANYO 1700 SCRC CELLS**

Charge Rate: 6.0A	Voltage Cutoff: .90V	
EXS174	20 Amp Sport-Tech 4 Cell 1700 SCRC	+\$44.85
EXS178	20 Amp Sport-Tech 6 Cell 1700 SCRC	+\$65.99
EXS179	20 Amp Sport-Tech 7 Cell 1700 SCRC	+\$78.50
Charge Rate: 5.0A	Voltage Cutoff: .90V	
EXR174	25 Amp Race-Tech 4 Cell 1700 SCRC	+\$55.00
EXR178	25 Amp Race-Tech 6 Cell 1700 SCRC	+\$81.99
EXR179	25 Amp Race-Tech 7 Cell 1700 SCRC	+\$95.99
Charge Rate: 4.0A	Voltage Cutoff: .85V	
EXW374	30 Amp World 30 4 Cell 1700 SCRC	•\$67.99
EXW378	30 Amp World 30 6 Cell 1700 SCRC	•\$102.75
EXW379	30 Amp World 30 7 Cell 1700 SCRC	•\$119.50

### **PANASONIC 1800SCR-Z SERIES CELLS**

New cells Have yellow/black wave-form shrink  
All new "Z" series 1800 mAh cells

Charge Rate: 5.0A	Voltage Cutoff: .85V	
EXSZ74	20 Amp Sport-Tech 4 Cell 1800 Z	+\$50.99
EXSZ76	20 Amp Sport-Tech 6 Cell 1800 Z	+\$72.49
EXSZ77	20 Amp Sport-Tech 7 Cell 1800 Z	+\$84.99

Charge Rate: 4.0A	Voltage Cutoff: .85V	
EXRZ74	25 Amp Race-Tech 4 Cell 1800 Z	+\$60.99
EXRZ76	25 Amp Race-Tech 6 Cell 1800 Z	+\$88.49
EXRZ77	25 Amp Race-Tech 7 Cell 1800 Z	+\$102.99

Charge Rate: 3.0A	Voltage Cutoff: .80V	
EXWZ34	30 Amp World-Tech 30 4 Cell 1800 Z	•\$73.99
EXWZ36	30 Amp World-Tech 30 6 Cell 1800 Z	•\$121.99
EXWZ37	30 Amp World-Tech 30 7 Cell 1800 Z	•\$142.99

### **ASSEMBLED MATCHED STICKS**

#### **TRINITY**

EXS146A	Sport-Tech 6 Cell 1400 SCR	+\$55.25
EXS178A	Sport-Tech 6 Cell 1700 SCRC	+\$76.75
EXSZ76A	Sport-Tech 6 Cell 1800 Panasonic Z	+\$82.99

Please Turn to Page 13 for the Conversion Chart To  
Compare EX-Tech Battery Pack Numbers

**TRINITY**





**RACER  
BATTERY  
PACKS**



## WORLD'S MOST POPULAR RACER BATTERY PACK

The Trinity ZIP PAK has again proven itself to be the most popular battery pack for the R/C Racer. This is due to the high performance and quality it shares with all the other Trinity/Epic assembled battery packs listed on this page. Only the latest freshest Sanyo cells are used. Dual welded tabs of 100% pure nickel and heavy gauge silicone leads provide you with the lowest possible resistance. To make sure your pack stays together we have encased the cells in our battery tubes to protect them from crash damage.



Always look for the Trinity/Sanyo name when it comes to batteries. That way you can be sure that you are getting quality cells, not seconds, rejects or cells made by unknown foreign battery manufacturers that fail after a couple of charges. Beware of anyone offering a better, cheaper battery pack than a Trinity/Sanyo pack as no such thing exists.

### 6 CELL SPORT PACKS

RC5889	Zip Pak™ Sanyo	\$22.99
RC5054	EX-Tech Sanyo 1400 SCR	\$48.25
RC5608	EX-Tech Sanyo 1700 SCRC	\$66.50
RC5776Z	EX-Tech Panasonic 1800Z	\$69.99

### STREET SPEC

SS2224	Street Spec 6 Cell EX-Spec Pack	\$23.99
SS2227	Street Spec 4 Cell EX-Spec Pack	\$17.99

### SPEEDWORKS

0010	1500 mAh Sport Pack, Sanyo cells	\$31.00
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### 7 CELL FLAT PACKS

RC5894	Zip Pak™ Sanyo	\$29.45
RC5754	EX-Tech Sanyo 1400 SCR	\$57.99
RC5610	EX-Tech Sanyo 1700 SCRC	\$79.50
RC5777Z	EX-Tech Panasonic 1800Z	\$82.99

### 7 CELL HUMP PACKS

RC5895	Zip Pak™ Sanyo	\$29.45
RC5762	EX-Tech Sanyo 1400 SCR	\$57.99
RC5611	EX-Tech Sanyo 1700 SCRC	\$79.50
RC5797Z	EX-Tech Panasonic 1800Z	\$82.99

### 6 CELL LTO PACKS

RC58890	Zip Pak™ Sanyo	\$22.99
RC50540	EX-Tech Sanyo 1400 SCR	\$48.25
RC56080	EX-Tech Sanyo 1700 SCRC	\$66.50
RC57760Z	EX-Tech Panasonic 1800Z	\$69.99

### 7 CELL LTO PACKS

RC58950	Zip Pak™	\$29.45
RC57540	EX-Tech Sanyo 1400 SCR	\$57.99
RC56100	EX-Tech Sanyo 1700 SCRC	\$79.50
RC5770Z	EX-Tech Panasonic 1800Z	\$82.99

### 6 CELL SADDLE PACKS

RC5558	EX-Tech Sanyo 1400 SCR	\$48.25
RC5609	EX-Tech Sanyo 1700 SCRC	\$66.50
RC5779Z	EX-Tech Panasonic 1800Z	\$69.99

### RECEIVER PACKS FOR 1/10-1/12 SCALE

RC5093	5 Cell Novak Plug (50 AA)	\$35.00
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## LAND, SEA, & AIR PACKS

High quality transmitter and receiver battery packs for all your R/C needs. Whether you race gas cars or fly 1/4 scale airplanes we have a battery pack for your needs.

Part#	# of cells	Cell Type	Voltage	mAh	Shape	List
-------	------------	-----------	---------	-----	-------	------

### RECEIVER PACKS WITH LEADS

AP001	4 Cell	600AA	4.8V	600mAh	Flat	\$17.99
AP002	4 Cell	270AA	4.8V	270mAh	Flat	\$22.49
AP003	4 Cell	1000AE	4.8V	1000mAh	Flat	\$27.99
AP004	4 Cell	700AAE	4.8V	700mAh	Flat	\$24.99
AP005	4 Cell	800AR	4.8V	800mAh	Flat	\$23.99
AP007	4 Cell	270AA	4.8V	270mAh	Sq	\$22.49
AP010	4 Cell	1200KR	4.8V	1200mAh	Flat	\$29.99
AP111	4 Cell	225AE	4.8V	225mAh	Flat	\$29.99
AP112	5 Cell	600AE	6V	600mAh	Sq	\$22.99
AP113	5 Cell	1000SCR	6V	1000mAh	Flat	\$33.25

### RECEIVER PACKS WITH FUTABA J PLUGS

AP114	5 Cell	600AE	6V	600mAh	Hmp	\$28.49
AP115	5 Cell	600AE	6V	600mAh	Flat	\$28.49
AP116	5 Cell	1000AE	6V	1000mAh	Flat	\$40.99
AP117	5 Cell	1000AE	6V	1000mAh	Hmp	\$40.99

### TRANSMITTER PACKS WITH LEADS

AP006	8 Cell	750AAE	9.6V	750mAh	Flat	\$41.99
AP008	8 Cell	600AA	9.6V	600mAh	Flat	\$31.99
AP009	8 Cell	600AA	9.6V	600mAh	Sq	\$31.99
NEW!!						
RC5559	Airtronics	9 Cell TX Pack w/plug	10.8 v			\$55.99





## ASSORTED BATTERY PACKS

RC5500	4 Cell Battery Pack for BRP Outlaw Oval	+\$16.99
RC5501	Hi-performance 5 Cell Outlaw Oval	+\$18.49
Try our BRP (formally Buds Racing Products) "Outlaw Oval" replacement battery packs for improved performance and longer run times. The 5 cell pack gives higher speeds.		
RC5760	8 Cell Turbo Pack, Tyco cars	+\$39.99
RC5901	4 Cell Legend Battery Pack	\$19.99
RC5902	6 Cell Legend Battery Pack	\$29.99
RC5619	Clod Buster Battery, 6 cell 4400 mAh	+\$115.00

## BATTERY ACCESSORIES

### TRINITY

RC5003	Battery Shunts, pure copper & silver plated	\$2.25
RC5004	Rosin Soldering Flux	\$4.99
RC5012	30 Ohm Discharge Resistors	\$2.99
RC5018	Solder, This is the best solder for packs	\$1.99
RC5101	Battery Washers, go over the ends of cells	\$2.00
RC5102	Stick Pack Building Kit, tube, endcaps, shrink	\$4.99
RC5104	Saddle Pack Building Kit, Lennon Lugs, shrink	\$6.99
RC5565	Battery Pack End Caps, 5 pr	\$3.99
RC5900	Battery Equalizer & Discharger Board,	\$32.50
RC5097	Lennon Lugs, Copper Battery Bars	\$4.99
RC5098	Same as above but 25 pieces	\$11.50
RC5887	Receiver Pack Accessory Kit, conditions pack	\$4.69

### SPEEDWORKS

0014	Dropping Resistors W/Clips, 2, 30 Ohm	\$5.99
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## PLUGS & CONNECTORS

RC6020	Tamiya Connector W/Wires	\$3.99
RC7011	Tamiya Plugs W/out Wire	\$2.69
RC5074	No Solder Leads W/Connectors, for motors	\$3.99
RC5080	No Solder Leads W/Bare End, no connectors	\$3.99
RC5041	Futaba J Plug W/Wire	\$5.99
RC5060	KO Plug W/Wire	\$5.25

## SHRINK WRAP

### FOR SINGLE CELLS

RC5075	Clear Precut 1.5" (20 pcs)	\$1.99
RC5166	Clear Precut 1.5" (100 pcs)	\$5.99

### FOR 6 CELL STICK PACKS

RC5167	Clear Precut 2.5" (6 pcs)	\$2.25
RC5168	Clear Precut 2.5" (25 pcs)	\$5.99

### FOR SADDLE OR 7 CELL FLAT PACKS

RC5173	Clear Precut 3" (6 pcs)	\$2.35
RC5174	Clear Precut 3" (25 pcs)	\$6.50

### FOR 7 CELL HUMP PACKS

RC5169	Clear Precut 3.5" (6 pcs)	\$2.45
RC5170	Clear Precut 3.5" (25 pcs)	\$6.75

## HOOK UP WIRE

RC5000	Pro Cable, Pink and Green (13awg, 2')	\$4.99
RC5001	Pro Cable, Pink and Green (13awg, 10')	\$18.99
RC5140	Pro Cable, Red and Black (14awg, 2')	\$3.99
RC5141	Pro Cable, Red and Black (14awg, 10')	\$15.16
RC5160	Pro Cable, Red and Black (16awg, 2')	\$1.99
RC5161	Pro Cable, Red and Black (16awg, 10')	\$7.59

## THE POWER BEHIND STREET SPEC!

Only one battery pack in the world was designed by Sanyo and Trinity especially for Street Spec racing. The "Ex-Spec" cell produces



a voltage output tailored for stock class motors. The cells internals have been beefed up so the cells are super consistent from cell to cell, charge after charge.

Ex-Tech cells are covered in their own distinctive shrink wrap so that they are easy to identify for tech inspectors.

Ex-Tech cells are assembled into 4 and 6 cell packs by Epic Energy Labs using the latest computerized welding technology. Each pack is finished off with clear shrink and its own non-removable sticker to make sure the pack is as tamper proof as possible. EX-Tech cells are not available unassembled, so no one will be able to buy a case of cells and match them!

If you race Street Spec cars or just fool around with your buggy in the street, Trinity EX-Spec battery packs are your only choice!

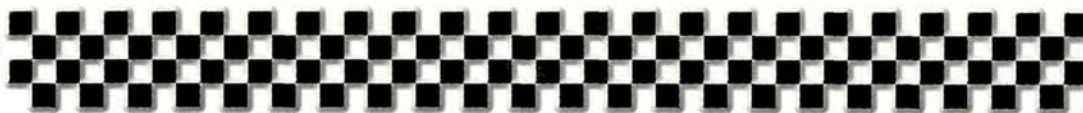
## EX-TECH DISCHARGE CONVERSION CHART

SPORT 20A	RACE 25A	WORLD 27A	WORLD 30 A
410	323	300	272
402	318	295	267
395	313	290	263
389	307	285	258
382	302	280	254
375	296	275	249
368	291	270	245
362	286	265	241
355	280	260	236
348	275	255	231
341	269	250	227
334	264	245	222
327	259	240	218
321	253	235	213
314	248	230	209
307	242	225	204
300	237	220	200
293	232	215	195
286	226	210	191
280	221	205	186

Here is a chart showing the run time comparison of our 20 amp Sport-Tech, 25 amp Race-Tech and 27 amp World-Tech cells to the new World-Tech 30 cells. For example a 355 Sport-Tech cell is equal to a 280 Race-Tech, or 236 World-Tech 30 Cell.

All Our EX-Tech cells are matched at 3 different levels to provide you with cell mapping at different rates to better suit your particular application.





## ANTENNAS

- RC6010 Fiberglass Roll Over Antenna, 1/12th scale \$6.99  
RC6030 Fluorescent Antenna Tubes, 4 pieces •\$1.99

## BALL BEARING SETS

### BUGGYS

- RC7860 Assoc. Team Car Bearing Set \$86.99  
RC7861 RC10T Truck Bearing Set \$81.99  
RC7862 Stealth Trans Bearing Set \$49.95  
RC7875 Losi XX Buggy Wheel & Hub BB Set •\$57.99  
RC7877 Losi XX Transmission Ball Bearing Set •\$42.99

### TRUCKS

- RC7084 Clod Buster Bearing Set \$82.99  
RC7899 Losi Jr-2/Jr-T Bearing Set \$39.99  
RC7876 Losi XX Truck Wheel & Hub BB Set •\$42.99  
RC7877 Losi XX Transmission Ball Bearing Set •\$42.99  
RC7870 RC10 T2 Ball Bearing Set •\$73.99

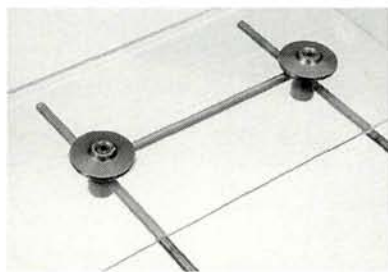
### ON-ROAD CARS

- EV0140 EV10 On-Road Ball Bearing Set •\$58.99  
EV4023 EV10 Super Speedway Bearing Set •\$58.99  
RC7098 Assoc. 12 L 1/12th On-Road Bearing Set \$51.99  
RC7889 Bolink LTO, Ball Bearing Set \$52.99  
RC7898 Assoc. 10L 1/10th On-Road Bearing Set \$52.99  
RE1070 Revolver22J or Magic Carpet Ride BB Set •\$58.99  
SS2021 Street Spec Bearing Set \$45.99

## BODY ACCESSORIES

- RC6002 Bent Up Body Clips, ends bent 5 \$1.99  
RC6002B Bent Up Gold Body Clips Bulk, 25 +\$7.50  
RC6003 Nylon Body Hole Washers \$1.25  
RC6008 Purple Aluminum Wing Buttons \$3.50  
RC7079 Shock Tower Wing Mounts, EV10, RC10 \$5.50  
RC6011 New Pro Buttons, for straight wire mount \$3.99  
RC6012 Pro Buttons W/Bent Wire for chassis mount \$4.99  
RC6013 Pro Buttons W/Bent Wire for body mount \$4.99

These wing buttons are a really trick design. Until now most people hated making a wing because it was a pain to bend the big piece of .078 wire into a "U" shape. With our new wing buttons this is no longer necessary. The unique but simple design uses straight pieces of piano wire for the mounts and these are held in place with set screws from the top of the wing buttons. A second set of holes are in the wing buttons 90 degrees to the wing wire holes. Just slip a straight piece of .078 wire through these, and secure with 2 set screws from the bottom and you have a quick easy to make super strong wing setup. The wing is still fully adjustable from the top. We offer this 3 ways; buttons alone, with wire for chassis mounted wing, and with wire for body mounted wing (stocker body).



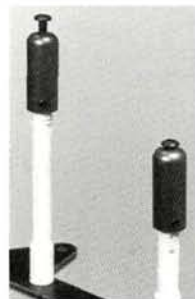
### NEW!

- RC6040 Body Cushions, 6 pieces •\$1.59  
Self adhesive foam body washers stick to the inside of the body for a better fit over body posts. Cushions body, stops vibration, keeps body from moving around on the body mounting posts.

### NEW!

- RC6041 Speedway Adjustable Body Mounts +\$12.75  
2-2" and 2-3" threaded posts  
RC6042 Replacement 2" Threaded Posts, 4 pcs +\$3.99  
RC6043 Replacement 3" Threaded Posts, 4 pcs +\$4.19  
RC6044 Replacement 4" Threaded Posts, 4 pcs +\$3.99  
RC6046 GTP Body Mounts, 4-1.5" threaded posts +\$12.99  
RC6047 Touring Car Body Mounts, 2-3", 2-4" +\$12.99  
RC6048 Replacement 1.5" Threaded Plastic Posts +\$3.99  
4 pieces

These new body posts are fully adjustable and allow mounting the body with screws. This is the way all the factory drivers mount their bodies. Using screws gives less drag than body clips, and insures that you will never have a body come loose. Also works great for all on-road and drag racing cars. Black posts with purple anodized aluminum adjusters.



### NEW!

- RC6051 EX-Pen, 2 sided detailing pen for bodies •\$13.99  
6 pieces per package  
RC6060 EX-Pen, 1 per package •\$2.50

## BUMPERS

- RC7026 Black Kydex Bumper Blank, 3 1/2 x 11" \$7.99  
RC7028 Wide RC10 Front Bumper - \$8.99

## DIFF/REAR AXLE PARTS

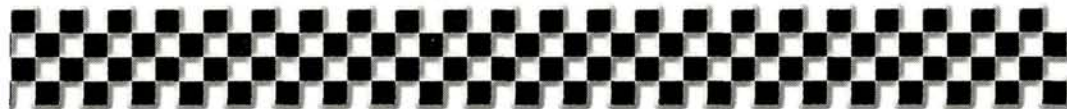
### TRINITY

- RC0110 Super Differential Balls, Grade 10, 16 pcs \$2.29  
RC0110B Super Differential Balls Bulk, 100 pcs \$12.50  
RC0114 Differential Rings, 6pcs \$3.50  
RC0118 Diff Pinning Kit, drill bit, post etc, \$5.99

### MAGIC MOTORSPORTS

- MM600 Notched Differential Rings, 1 pr \$3.99  
MM2000 1/4" Axle Shims, on-road rear axles 10 pc \$1.99  
MM2001 1/8" Axle Shims, 1/12th front axles 10 pc \$1.99





## GEARS, PINIONS

### MAGIC MOTORSPORTS, ZERO GRAVITY™

The latest in power producing pinion gears, these pinions are top hobbled from 6061 T6 aircraft aluminum and meet A.G.M.A. 48 standards. We use a proprietary aerospace coating which is extremely wear resistant, and it contains teflon for a very low coefficient of friction. All pinions will have the tooth size on the side of the shaft.

#### 48 PITCH ZERO GRAVITY PINIONS

M4812	12 Tooth Pinion Gear	\$5.99
M4813	13 Tooth Pinion Gear	\$5.99
M4814	14 Tooth Pinion Gear	\$5.99
M4815	15 Tooth Pinion Gear	\$5.99
M4816	16 Tooth Pinion Gear	\$5.99
M4817	17 Tooth Pinion Gear	\$5.99
M4818	18 Tooth Pinion Gear	\$5.99
M4819	19 Tooth Pinion Gear	\$5.99
M4820	20 Tooth Pinion Gear	\$5.99
M4821	21 Tooth Pinion Gear	\$5.99
M4822	22 Tooth Pinion Gear	\$5.99
M4823	23 Tooth Pinion Gear	\$5.99
M4824	24 Tooth Pinion Gear	\$5.99
M4825	25 Tooth Pinion Gear	\$5.99
M4826	26 Tooth Pinion Gear	\$5.99
M4827	27 Tooth Pinion Gear	\$5.99
M4828	28 Tooth Pinion Gear	\$5.99
M4829	29 Tooth Pinion Gear	\$5.99
M4830	30 Tooth Pinion Gear	\$5.99

#### 64 PITCH ZERO GRAVITY PINIONS

M6415	15 Tooth Pinion Gear	\$5.99
M6416	16 Tooth Pinion Gear	\$5.99
M6417	17 Tooth Pinion Gear	\$5.99
M6418	18 Tooth Pinion Gear	\$5.99
M6419	19 Tooth Pinion Gear	\$5.99
M6420	20 Tooth Pinion Gear	\$5.99
M6421	21 Tooth Pinion Gear	\$5.99
M6422	22 Tooth Pinion Gear	\$5.99
M6423	23 Tooth Pinion Gear	\$5.99
M6424	24 Tooth Pinion Gear	\$5.99
M6425	25 Tooth Pinion Gear	\$5.99
M6426	26 Tooth Pinion Gear	\$5.99
M6427	27 Tooth Pinion Gear	\$5.99
M6428	28 Tooth Pinion Gear	\$5.99
M6429	29 Tooth Pinion Gear	\$5.99
M6430	30 Tooth Pinion Gear	\$5.99
M6431	31 Tooth Pinion Gear	\$5.99
M6432	32 Tooth Pinion Gear	\$5.99
M6433	33 Tooth Pinion Gear	\$5.99
M6434	34 Tooth Pinion Gear	\$5.99
M6435	35 Tooth Pinion Gear	\$5.99
M6436	36 Tooth Pinion Gear	\$5.99
M6437	37 Tooth Pinion Gear	\$5.99
M6438	38 Tooth Pinion Gear	\$5.99
M6439	39 Tooth Pinion Gear	\$5.99
M6440	40 Tooth Pinion Gear	\$5.99
M6444	44 Tooth Pinion Gear	\$5.99
M6448	48 Tooth Pinion Gear	\$5.99
M6450	50 Tooth Pinion Gear	\$5.99

### KINWALD "HARD ONES" 48 PITCH PINIONS

New from Brian Kinwalds Team Kinwald is the new "Hard Ones" steel off-road pinions. Made to the Zero Gravity design, each pinion is case hardened to a guaranteed 58-62 Rockwell C hardness. The hardening process of the material is consistent up to .0010 into the depth of the gear surface. This means the gear would have to be completely destroyed before it would lose its tooth form. We do not believe any other gear manufacturer could make this claim, therefore making these pinions the absolute strongest in the industry. The final step is a black oxide coating which is applied to prevent rusting prior to gear use.



TK4812	12 Tooth Hard One 48 Pitch Pinion	\$4.99
TK4813	13 Tooth Hard One 48 Pitch Pinion	\$4.99
TK4814	14 Tooth Hard One 48 Pitch Pinion	\$4.99
TK4815	15 Tooth Hard One 48 Pitch Pinion	\$4.99
TK4816	16 Tooth Hard One 48 Pitch Pinion	\$4.99
TK4817	17 Tooth Hard One 48 Pitch Pinion	\$4.99
TK4818	18 Tooth Hard One 48 Pitch Pinion	\$4.99
TK4819	19 Tooth Hard One 48 Pitch Pinion	\$4.99
TK4820	20 Tooth Hard One 48 Pitch Pinion	\$4.99
TK4821	21 Tooth Hard One 48 Pitch Pinion	\$4.99
TK4822	22 Tooth Hard One 48 Pitch Pinion	\$4.99
TK4823	23 Tooth Hard One 48 Pitch Pinion	\$4.99
TK4824	24 Tooth Hard One 48 Pitch Pinion	\$4.99
TK4825	25 Tooth Hard One 48 Pitch Pinion	\$4.99
TK4826	26 Tooth Hard One 48 Pitch Pinion	\$4.99
TK4827	27 Tooth Hard One 48 Pitch Pinion	\$4.99

## GEARS, SPUR MAGIC

The Magic spurs are designed to allow you to build your gears at home not at the track. Any standard diff ring snaps into place so you can put all the balls and lubricant in your diff, snap the other ring into place and put the gear in your box. No more lost balls. The design also shields the diff balls so less dirt gets into your differential. Fits all popular cars, that use standard diff rings (i.e. Evolution 10, Revolver 12, Associated 10L, 12L, etc).  
Magic 64 Pitch Spur Gears

MM195	95 Tooth Spur Gear	\$3.99
MM100	100 Tooth Spur Gear	\$3.99
MM105	105 Tooth Spur Gear	\$3.99
MM110	110 Tooth Spur Gear	\$3.99
MM115	115 Tooth Spur Gear	\$3.99
MM120	120 Tooth Spur Gear	\$3.99
MM125	125 Tooth Spur Gear	\$3.99

More gears on the next page....





## MAGIC MOTORSPORTS STEALTH SPURS

These flat sided "Stealth" spur gears are designed to fit most cars and especially the "Associated Stealth" transmission. The tooth pattern has been designed for the best mesh and lowest possible drag. Our molding techniques assure that every gear is perfectly true and round and the composite material we use makes the teeth super strong. Fits all RC10 and 10L-12L, Evolution 10, Revolver 12, Bolink, Hyperdrive.



### STEALTH 48 PITCH SPUR GEARS

MM778	78 Tooth Spur Gear	\$3.99
MM783	83 Tooth Spur Gear	\$3.99
MM786	86 Tooth Spur Gear	\$3.99
MM789	89 Tooth Spur Gear	\$3.99
MM792	92 Tooth Spur Gear	\$3.99
MM795	95 Tooth Spur Gear	\$3.99

### STEALTH 64 PITCH SPUR GEARS

MM790	95 Tooth Spur Gear	\$3.99
MM700	100 Tooth Spur Gear	\$3.99
MM705	105 Tooth Spur Gear	\$3.99
MM710	110 Tooth Spur Gear	\$3.99
MM715	115 Tooth Spur Gear	\$3.99
MM720	120 Tooth Spur Gear	\$3.99
MM725	125 Tooth Spur Gear	\$3.99

## LUBRICANTS, OILS & MOTOR SPRAY

### TEAM KINWALD

TK2001 Formula '96 •\$5.99

Specially formulated power drops for off-road stock and modified motors. Increases horsepower, while containing an agent that repels dirt from the commutator. Keeps commutator cleaner running, keeps the motor faster longer. Also excellent as a lubricant while breaking in brushes.

TK2002 Formula '96 refill, 2 ounces •\$6.99

### TRINITY

RC4441 The Solution™ Cleaning Spray •\$5.49

This is the best motor spray on the market and the only one we recommend for cleaning Trinity motors. Does not harm the motor brushes. Used by Team Trinity & Team Losi exclusively!

RC4024	Turbo Drops™, increases rpms	\$4.99
RC4025	Modified Motor Micro Oiler, for bearings	\$4.49
RC4026	Stock Motor Micro Oiler, for bushings	\$4.49
RC4040	Revtech Drops, increases motor rpms	\$4.25
RC4047	Revtech Drop Refill, 2 oz	\$5.50
RC4469	Motor Break In Drops	\$3.99

These break in drops were specially formulated to quickly break in the motor brushes while cooling the commutator surface.

Just a few drops breaks in brushes perfectly in a few minutes, instead of an hour.

## SILICONE SHOCK OIL

100% pure silicone shock oil will not change weight regardless of conditions you have to race under. Special formula is resistant to temperature change and will not break down under use. No longer will you have to change your shock oil when the temperature drops right before the main. Used by legendary off-road stars Brian Kinwald and Greg Hodapp in their Team Losi cars, along with Joel Magic Johnson in his Revolver 22j and EV10.



RC7610	10 Weight Silicone Shock Oil	\$3.50
RC7615	15 Weight Silicone Shock Oil	\$3.50
RC7620	20 Weight Silicone Shock Oil	\$3.50
RC7625	25 Weight Silicone Shock Oil	\$3.50
RC7630	30 Weight Silicone Shock Oil	\$3.50
RC7635	35 Weight Silicone Shock Oil	\$3.50
RC7640	40 Weight Silicone Shock Oil	\$3.50
RC7645	45 Weight Silicone Shock Oil	\$3.50
RC7650	50 Weight Silicone Shock Oil	\$3.50
RC7655	55 Weight Silicone Shock Oil	\$3.50
RC7660	60 Weight Silicone Shock Oil	\$3.50
RC7670	70 Weight Silicone Shock Oil	\$3.50
RC7680	80 Weight Silicone Shock Oil	\$3.50
RC7690	90 Weight Silicone Shock Oil	\$3.50
RC7100	100 Weight Silicone Shock Oil	\$3.50

## SILICONE LUBES

RC6009	Silicone In Squeeze Bottle, medium	\$4.99
RC0292	Silicone Differential Lube, light	\$5.99
RC4442	Pure Silicone Diff Lube, heavy	\$2.50

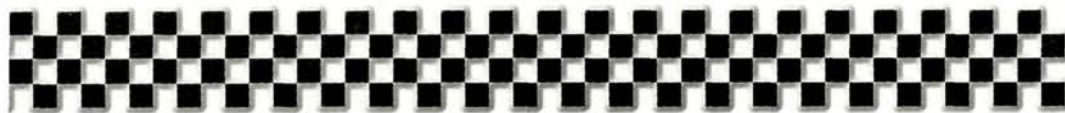
### NEW!

RC6050 Purple Stuff Damper Lube •\$1.99

Extra-extra heavy damper lube for front kingpins of on-road cars like the Associated RC10L-12L, Revolver 22j and the Evolution 10. Used by all the factory team racers. Works especially well on super speedway tracks. Lasts longer, provides more dampening.







## TIRE TRACTION

NEW!

### TEAM KINWALD

TK2000 Buggy Grip, traction compound

•\$7.99

The off-road Team Racers hot secret. Use this on your buggy and truck tires to soften the rubber and give more grip. Softens the natural rubber tires made by Pro-Line and Team Losi so they produce more traction. Restores the rubbers natural grip. Apply to tires several times the day before racing to condition and soften rubber. Apply to tires before each run. Allow to air dry before putting car on track. The first and best Traction Formula for spiked tires on dirt! Easy to use container with sprayer allows for full coverage of tire and spikes.



TK2005 Replacement Spray Top for Buggy Grip •\$1.59

### TRINITY

RC6680 Zip Grip™, universal traction \$6.99

Zip Grip is our standard all around foam tire traction compound blended especially with the new "Natural" rubber compounds like pink, white, gold etc. Zip Grip provides traction and also conditions the rubber so its natural stickiness is enhanced. Easily lasts 8 minutes.

RC6682 Whip Grip™, new cap tire traction \$6.99

Whip Grip was developed for capped tires on concrete tracks. Makes coming off the line a snap, no more spin outs. Conditions and softens tires so they heat up faster naturally. No sticky goo to pick up all the dirt on the track.

RC6683 Zip Grip Free™, no wintergreen odor \$6.99

Zip Grip Free is a traction we developed that works as well as Zip Grip, but does not contain any wintergreen. This is legal for races where odorless traction is required, especially in Europe.

RC6677 ProStik™, carpet tire traction \$6.99

Excellent indoor tire traction. Works best with standard foam compounds like green, blue, orange, yellow.

RC6016 Magic Bite Red Dot™ outdoor traction +\$6.99

Super sticky compound for outdoor racing with all types of foam tires. A must for slippery track conditions.



## SCREWS

### PURPLE ALUMINUM SCREW KITS

#### TRINITY

EV0142 Evolution 10, On-road \$19.99

EV0157 Evolution 10, SS or LSD •\$19.99

RE1027 Revolver 12, On-road or SS \$13.50

RE1060 Revolver 22j, On-road •\$13.50

## TRINITY

#### ASSOCIATED

EV0146 10L, On-road, 12LW or LSD \$11.99

EV0156 12L, On-road •\$11.99

EV0147 RC10 Buggies, All Styles \$14.99

EV0148 RC10T Trucks, All Styles \$18.99

EV0159 RC10T2 Truck •\$18.99

EV0160 RC10B2 Buggy •\$18.99

#### BOLINK

EV0158 Bolink, On-road or SS •\$12.99

#### TEAM LOSI

EV0149 Losi XX Buggy \$12.99

EV0155 Losi XX Truck •\$12.99

#### NEW!

RC6045 Transmitter Screw Kit •\$7.99  
Fits Futaba/KO/JR/Air

### PURPLE SCREWS AND NUTS

D1052 4-40x3/8 Cap Head Screws 12 pc \$4.99

D1053 4-40x3/8 Flat Head Screws 12 pc \$4.99

D1054 8-32x7/8 Flat Head Screws 6 pc \$2.99

D1055 4-40x1/4 Cap Head Screws 12 pc \$4.99

EV0150 2-56x1/4 Button Head Screws 12 pc \$5.99

EV0151 8-32x5/8 Flat Head Screws 12 pc \$4.99

EV0152 4-40x1/2 Socket Head Screws 12 pc \$5.99

EV0153 4-40x1/2 Flat Head Screws 12 pc \$4.99

EV0154 4-40x3/4 Socket Head Screws 12 pc \$4.99

EV0143 4-40 Mini Lock Nuts 8 pc \$3.50

EV0143-25 4-40 Mini Lock Nuts 25 pc \$8.99

EV4054 8-32 Nuts 8 pc \$3.99

## SET SCREWS

RC0111 Pinion 4-40 Set Screws 10 pc \$2.25

## SERVO MOUNTS

RC6053 Adjustable Purple Aluminum Mounts •\$10.99

These purple aluminum adjustable servo mounts fit all 1/12th and 1/10th scale on-road cars. They are designed to allow the correct servo mounting height to eliminated bump steer. Easily adjustable, comes with all hardware.



## SERVO TAPE

RC6000 Narrow Servo Tape, 3/4" \$3.29

RC6001 Wide Servo Tape, 1 1/2" \$3.79

RC6007 Wing and Spoiler Tape, super thin \$2.99





## **TIE WRAPS**

### **SPEEDWORKS**

0672	Fluorescent Tie Wraps, 8" 16 pcs	\$2.49
0677	Mini Fluorescent Tie Wraps, 4" 25 pcs	\$2.59

## **TIRES**

### **TRINITY 2.2" OFF-ROAD**

The 2.2's have several advantages over a standard wheel and tire set-up. The obvious difference is the overall diameter of the tire. The bigger the diameter, the more spikes per inch are in contact with the track surface as the tire rotates. Also a larger tire tends to change direction slower, so once your car is going straight it tends to want to run nice and straight. This is really important on a bumpy track.

Trinity 2.2's fit all 2.2" wheels.

#### **Rear Tires**

RC7421	Standard Spike (soft)	\$5.99
RC7422	Standard Spike (hard)	\$5.99
RC7412	Mini Spike (hard)	\$5.99
RC7436	Triad (hard)	\$5.99
RC7911	Dash Pattern (P rubber)	\$5.99

#### **Front Tires**

RC7424	Cut Spike (Hard)	\$5.99
RC7425	Mini Spikes (soft)	\$5.99
RC7426	Mini Spikes (hard)	\$5.99
RC7450	Mini Spike Front (med)	\$5.99

#### **2.2" Front Rims**

RC7482	Yokomo 4wd Front Rims, white	\$1.99
RC7428	Kyosho 4wd Front Rim	\$1.99

#### **2.2" Rear Rims**

RC7442	Yokomo Rear Rims, white	\$1.99
RC7416	Kyosho Rear Rims	\$1.99

### **TRINITY 2.1" FRONT TIRES**

RC7907	2.1" Triad Pattern Front Tire	\$3.99
RC7908	2.1" Dash Pattern Front Tire	\$3.99
RC7909	2.1" Mini Dash Pattern Front Tire	\$3.99

### **TRINITY MONSTER TRUCK OFF-ROAD TIRES**

Trinity Baja™ tires fit all racing truck rims.

RC7912	Dash Pattern Truck Tire, front or rear	\$9.99
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### **TRINITY TRUCK ON-ROAD FOAM TIRES**

RC7980	Blackfoot Front Tires	\$15.99
RC7981	Blackfoot Rear Tires	\$15.99
RC7982	RC10 Rear Tires	\$15.99
RC7983	JRX-Pro-T Rear Tires	\$15.99
RC7984	RC10, JRX Front Tires	\$15.99
RC7986	RC10T Rear Tires	\$15.99
RC7988	RC10T Front Tires	\$15.99
RC7999	Replacement Foam Donuts	\$9.99

### **PURPLE CHROME TRUCK WHEELS**

RC7700	Blackfoot Front Rims	\$5.99
RC7702	Blackfoot Rear Rims	\$5.99
RC7704	King Cab/Kyosho Rear Rims	\$5.99
RC7705	Jrx-Pro Rear Rims	\$5.99
RC7706	RC10 Rear Rims	\$5.99
RC7707	Jrx-Pro, RC10, Front Rims	\$5.99
RC7709	King Cab Front Rims	\$5.99
RC7987	RC10T Rear Rims	\$5.99
RC7989	RC10T Front Rims	\$5.99

### **2" OFF-ROAD BUGGY WHEELS**

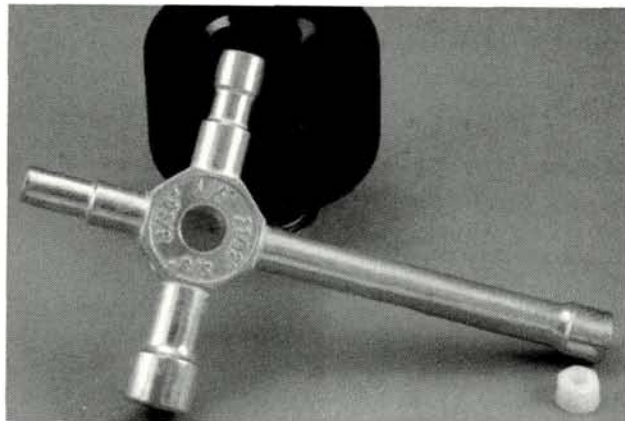
#### **3 PIECE MODULAR PURPLE CHROME**

RC7900	2" RC10 Rear Wheel	\$2.99
RC7901	2" JRX-Pro Rear Wheel	\$2.99
RC7902	2" Ultima Rear Wheel	\$2.99
RC7903	2.1" RC10, JRX-Pro, Kyo, Front	\$2.99

## **TOOLS**

RC6018	Wire Cleaning Brush	\$4.75
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NEW!



RC7020	Quad Wrench, 4 way nut driver	•\$4.99
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The Quad Wrench has all the popular nut drivers built into one tool. 3/16, 1/4, 11/32 and 3/8". Fits all the nuts on your Team Losi or Associated buggy or truck! Never pick up the wrong tool again!

RC7913	Brush Hood Alignment Tool	\$10.99
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## **TRINITY PRO WRENCHES**

All new designed Pro-Wrenches for the serious R/C racer. This purple anodized aluminum wrenches have a bigger easier to use handle and feature a full length drill blank tip.



- |        |  |          |
|--------|--|----------|
| RC7362 | 035 "Assoc." Trans Wrench, idlers RC10 | •\$12.50 |
| RC7363 | .050 Pinion Set Screw Wrench           | •\$12.50 |
| RC7364 | .063 Wrench                            | •\$12.50 |
| RC7365 | .093 Wrench, fits 4/40 screws          | •\$12.50 |
| RC7366 | Metric Pinion Wrench Tamiya, Kyo       | •\$12.50 |
| RC7367 | 2.5 mm Motor Wrench, fits motor screws | •\$12.50 |

## DUAL SIDED PRO WRENCHES

- |        |  |         |
|--------|--|---------|
| RC7800 | The Tool, 2 sided, .050 and 2.5mm tips | \$19.99 |
| RC7801 | The Tool Too, .050 and .093 screw tips | \$19.99 |

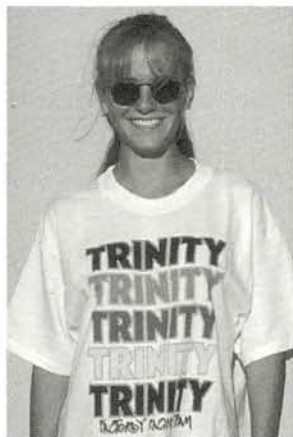
## REPLACEMENT DRILL BLANK TIPS

**Fits all drill blank wrenches**

- |        |                          |         |
|--------|--------------------------|---------|
| RC7059 | .035 Tip                 | \$6.99  |
| RC6055 | .050 Wrench Tips (1 pc.) | \$6.99  |
| RC6005 | .050 Wrench Tips (6 pc.) | \$34.99 |
| RC7060 | .063 Wrench Tip          | \$6.99  |
| RC7061 | .093 Wrench Tip          | \$6.99  |
| RC7063 | Metric Pinion Tip        | \$6.99  |
| RC7062 | 2.5mm Wrench Tip         | \$6.99  |

## OFFICIAL TEAM SHIRTS

### TRINITY FACTORY TEAM SHIRTS



- |        |                                 |          |
|--------|---------------------------------|----------|
| RC9101 | Trinity Team T Shirt, large     | +\$19.99 |
| RC9102 | Trinity Team T Shirt, x large   | +\$19.99 |
| RC9103 | Trinity Team T Shirt, xx large  | +\$21.99 |
| RC9104 | Trinity Team T Shirt, xxx large | +\$23.99 |



RC9032 Transmitter Bag



RC9031, The Pouch CD Bag



## TRINITY/LOSI MONSTERS OF DIRT SHIRT



- |        |  |          |
|--------|--|----------|
| RC9120 | Trinity Losi Team Dirt Shirt, Large    | •\$19.99 |
| RC9121 | Trinity Losi Team Dirt Shirt, X Large  | •\$19.99 |
| RC9122 | Trinity Losi Team Dirt Shirt, XX Large | •\$21.99 |
| RC9123 | Trinity Losi Team Shirt, XXX Large     | •\$23.99 |
| RC9124 | Trinity Losi Team Shirt, XXXX Large    | •\$23.99 |

## TRINITY OFFICIAL TEAM HAT

- |        |          |         |
|--------|----------|---------|
| RC9110 | Team Hat | \$25.00 |
|--------|----------|---------|

## BANNERS

- |        |                     |         |
|--------|---------------------|---------|
| RC9005 | Team Trinity Banner | \$15.00 |
|--------|---------------------|---------|

## STICKERS

New!

- |        |   |         |
|--------|---|---------|
| RC9014 | Trinity Logo Sticker Sheet                | •\$5.99 |
| RC9015 | Stock Car Sticker Sheet, w/fender cluster | •\$5.99 |
| RC9016 | Touring Car Sticker Sheet, w/ numbers     | •\$5.99 |
| RC9012 | Off-Road Truck/Buggy Sticker Sheet        | •\$5.99 |
| S2239  | Street Spec Sticker Sheet                 | •\$3.99 |

## HAULER AND TRANS BAGS

- |        |                                      |          |
|--------|--------------------------------------|----------|
| RC9037 | Team Trinity Hauler Bag, Black       | \$39.99  |
| RC9038 | Team Trinity Hauler Bag, Purple      | \$39.99  |
| RC9031 | The Pouch, CD carrying case, purple  | \$15.99  |
| RC9032 | Trinity Logo Transmitter Bag, purple | \$19.99  |
| RC9075 | Monster Car-go Bag, Black            | •\$49.99 |

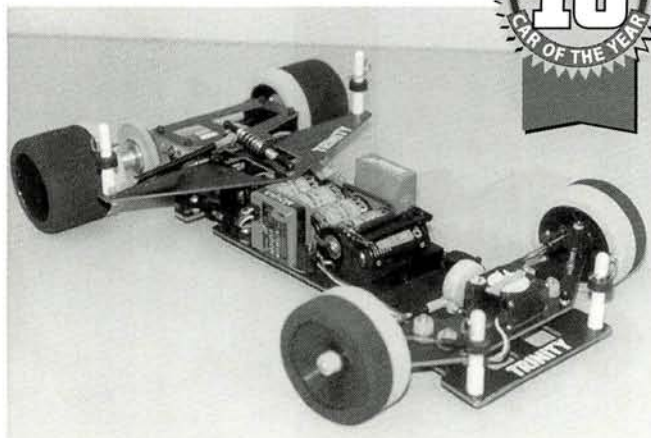
Right... Monster Car-go  
Bag RC9075

Below... Team Hauler  
Bag RC9037



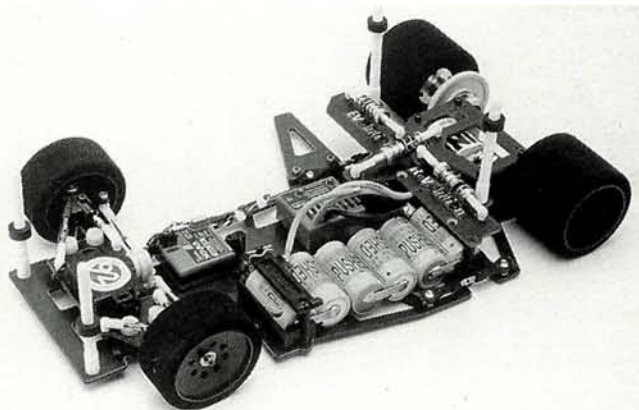


## EVOLUTION 10



**IFMAR WORLD, ROAR NATIONAL CHAMPION**

## EVOLUTION 10SS



**PROCAR WORLD, ROAR NATIONAL CHAMPION**

### EVOLUTION 10 CAR KITS

The Evolution 10 has proven itself in both road course and super speedway racing, by winning both the IFMAR on-road and PROCAR Speedway World Championships plus too many ROAR titles to list. The Evolution 10 was awarded the "RC Car Action" 1/10th car of the year! The Evolution cars all feature the famous Reactive Caster™ front suspension which allows for easy adjustment of caster, camber, ride height, roll rate and toe-in. The rear pod is suspended on a mono-ball rear pivot with trailing links. Batteries are mounted down the middle to make cornering quicker and more precise. The EV10 is the best handling 1/10th scale car you will ever have an opportunity to drive and is now available in 2 versions. The Deluxe World and National championship version for the serious racer and a new fiberglass version for the entry level racer.

#### ON-ROAD MODELS

EV0018 Evolution10F World Champion •\$199.99  
Fiberglass chassis, steel screws rear axle ball bearings. Fiberglass version of Joels World Championship winning car.

EV0007 Evolution 10 Deluxe On-road Kit \$399.99  
1994 ROAR Modified National Champion. Features all the hop-up parts including the light weight graphite chassis plates. All purple aluminum hardware, light weight hubs etc. Definitely the "state of the art" road racing vehicle.

#### SUPER SPEEDWAY MODELS

EV0009 Evolution 10ss Super Speedway Car Kit \$369.99  
Super Speedway version of the EV10.

EV0014 LSD Conversion Kit, EV10ss to LSD \$89.95  
Convert the Evolution 10ss kit you already have to an EV10 LSD. Left Side Drive is an advantage on high banked tracks, (Daytona style) where you are always turning. More left side weight bias.

### REVOLVER CAR KITS

RE0012 Revolver 22j On-road Kit

•\$299.99

This is the car used by Joel Johnson and Jim Deiter to sweep the the '95 ROAR On-Road & Oval National Championships. The Revolver 22j features a Reactive Caster™ front suspension to make this the quickest cornering 1/12th scale car ever. Also included in the kit are all light weight purple anodized aluminum hardware, hubs and special lightweight graphite chassis plates.



Joel won his 22nd ROAR National Championships with the Revolver 22j

RE0008 Revolver 12M6 Magic Carpet Ride

\$299.99

Super lite and designed with the revolutionary Mono Shock independent front suspension. This is the same technology as used on full scale Jordan and Tyrrell Formula 1 cars. Comes with all light weight graphite and aluminum parts. Works killer on high speed outdoor asphalt tracks and not perfectly smooth carpet tracks.

RE0009 Mono Shock Front Suspension

\$39.99

Same as Magic Carpet Ride, Bolts right on 22j. For Bumpy Tracks.

RE1020 Revolver Speedway Chassis for both above \$55.50

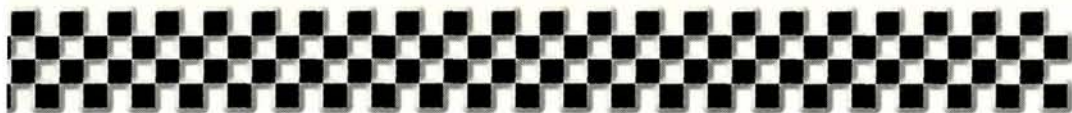
RE1040 Revolver 4 Cell Chassis for both above \$49.99

The LSD Conversion kit will allow you to convert your EV10 Super Speedway to Left Side Drive. The new Midnight Reverse is an excellent stock motor for this car! Kit includes upper and lower pod plates, LSD motor mount. Chassis not included.

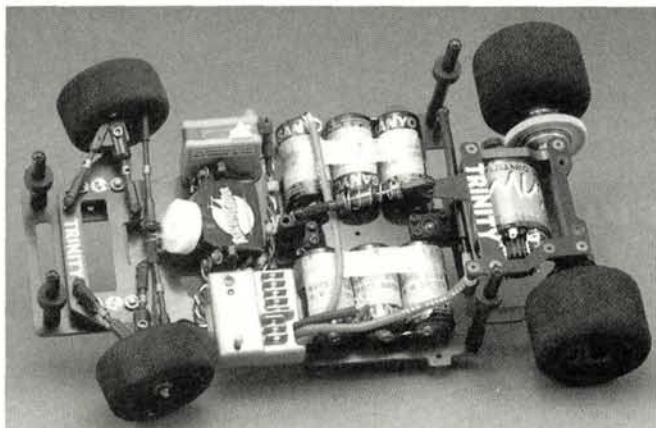


**TRINITY**



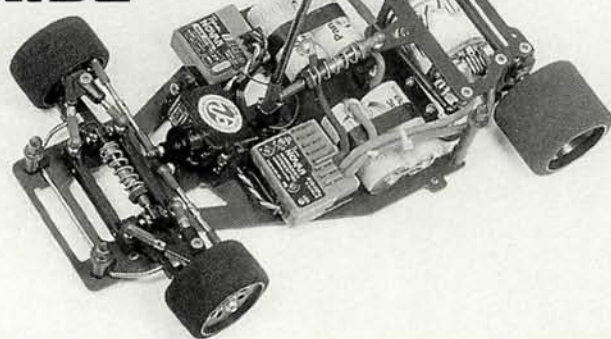


## REVOLVER 22j



**1995 ROAR 6 CELL NATIONAL CHAMPION  
ON-ROAD & SUPER SPEEDWAY**

## REVOLVER 12 MAGIC CARPET RIDE

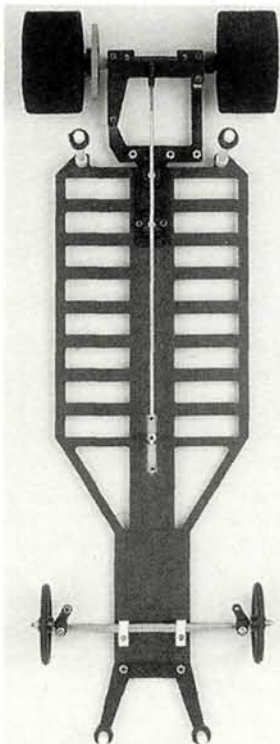


**MONO SHOCK FRONT SUSPENSION SYSTEM**

## DRAGWORKS CAR KITS

The fastest and lightest drag race cars are now available from Trinity under the Dragworks name. These new designs from Jim Dieter who penned the World Championship winning Evolution and Revolver series of cars, brings high technology to drag racing. These are not the pod bolted to a chassis plate designs you are accustomed to, but real tunable race cars.

The Dragworks cars feature: Graphite chassis and pod plates Lightweight machined aluminum motor mounts Lightweight clamp on wheel hubs, to keep axles from splitting. Aluminum screws for less weight. "T" bar construction, for more traction, easily adjustable tweak. Aluminum beam front axle with adjustable caster. Breakaway front body mounts, saves chassis plates during crashes. Pull Bar setup to adjust traction by controlling motor torque transfer. All Aluminum parts, pod plates, screws, etc. are anodized purple. Lightweight CKW tires come with kit. Detailed instructions with tuning tips Can be made rear engine with after market conversion plate.



- |        |                                    |          |
|--------|------------------------------------|----------|
| DW0001 | Pro Stock Car Kit (up to 14 cells) | \$249.00 |
| DW0002 | Funny Car Kit (up to 16 cells)     | \$279.00 |

## STREET SPEC CAR KITS

Street Spec is the fastest growing class of racing in the world. All aspects of Street Spec racing are controlled so that it is truly the only class of R/C racing where a driver's skill is more important than how



much money he spends. No hop up parts are allowed and everyone has to run the same tires, motor, body, chassis, battery and gear ratio etc. Don't miss out on the best racing in the world. Trinity Street Spec cars come both with motor and battery or without. They also come in Stock Car, Touring Car and Speedway Truck body styles.

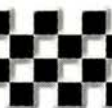
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|--------|---------------------------------------|-----------|
| SS2222 | Spec 10 W/Motor/Stocker Body/Battery  | •\$199.99 |
| SS2223 | Spec 10 No Motor/Battery              | •\$165.00 |
| SS2230 | Spec 10T W/Motor/Touring Body/Battery | •\$199.99 |
| SS2231 | Spec 10T No Motor/Battery             | •\$165.00 |
| SS2240 | Spec 10N W/Motor/TruckBody/Battery    | •\$199.99 |
| SS2241 | Spec 10N No Motor/Battery             | •\$165.00 |

Full scale  
NASTRUCK  
Racing is  
becoming very  
popular and  
its also  
becoming the  
biggest class  
for Street Spec!



**TRINITY**





## EV10 EV10F & EV10SS Common Parts

Part#	Item	Qty	Price
EV0023	Front kingpins	2	\$2.99
EV0024	Nylon upper ball supports	2	\$4.50
EV0025	.022" front suspension spring	2	\$2.00
EV0026P	Purple aluminum clevis	2	\$10.99
EV0027	1.125" X 4-40 turnbuckle	4	\$10.99
EV0029	4-40 locknuts	4	\$0.99
EV0030	Nylon ball cups	4	\$2.99
EV0031	Delrin balls	2	\$1.99
EV0032	Complete micro shock	1	\$17.99
EV0033	Aluminum micro shock body	1	\$9.99
EV0034	Nylon micro shock cylinder nut	2	\$2.50
EV0035	Silicone o-ring, micro shock	4	\$0.99
EV0036N	Nylon adjuster nut, micro shock	2	\$2.89
EV0037	Pressurization spring, micro shock	4	\$2.99
EV0038	Aluminum shock shaft cap	2	\$8.99
EV0039	Micro shock shaft	2	\$9.99
EV0040	Brass micro shock shaft washer	4	\$0.99
EV0041	Suspension spring 5 lb.	2	\$2.00
EV0042	Suspension spring 11 lb.	2	\$2.00
EV0043	Suspension spring 15 lb.	2	\$2.00
EV0044	Suspension spring 23 lb.	2	\$2.00
EV0047	Aluminum ball studs	4	\$3.99
EV0048	4-40 aluminum locknuts	8	\$2.99
EV0049	8-32 X 7/8 alum flatheads	4	\$1.49
EV0050	8-32 nylon nuts	4	\$0.99
EV0051	Front nylon kingpin bushings	2	\$1.59
EV0052	Nylon clevis	2	\$1.99
EV0053	Front axle spacer set	1	\$3.59
EV0054	1/8" silicone o-ring	4	\$0.99
EV0056	1/4" X 3/8" unflanged bearing	1	\$7.50
EV0057	1/4" X 3/8" flanged bearing	2	\$14.00
EV0058	1/8" X 1/4" steel washers	4	\$0.99
EV0059	1/8" e-clips	12	\$1.29
EV0062	Nylon left bulkhead	1	\$1.99
EV0063	Aluminum right bulkhead	1	\$14.99
EV0064	4-40 X 3/8" flathead screws	8	\$0.99
EV0065	4-40 X 3/8" cap screws	8	\$0.99
EV0066	Graphite ball plate	1	\$3.99
EV0068	1/4" aluminum pivot ball	2	\$3.99
EV0069	3/16" aluminum standoff	2	\$3.99
EV0070	Nylon rear battery cup	1	\$2.99
EV0071	2-56 steel buttonhead screws	8	\$1.99
EV0072	Nylon pivot ball socket set	1	\$1.99
EV0073	1/8" thick aluminum spacer	2	\$0.99
EV0074	4-40 X 1/2" steel screws	8	\$0.99
EV0075	Nylon ball link socket	4	\$1.99
EV0076	Aluminum control link balls	4	\$6.99
EV0080	Thrust cone	1	\$1.99
EV0081	Belleville washers	4	\$1.99
EV0082	Nylon axle shim set	1	\$1.99
EV0083	Nylon front battery cup	1	\$1.99
EV0084	Nylon front battery cup lid	1	\$1.99
EV0086	Nylon body post collars	4	\$2.99

EV0087	4-40 X 1/8" set screws	8	\$1.29
EV0089	4-40 X 1/2" cap screws	5	\$2.99
EV0090	Body clips	6	\$2.99
EV0091	Ride height adjuster set	1	\$2.69
EV0092	1/8" diff balls	12	\$2.99
EV0093	Diff rings	2	\$2.99
EV0110	Silicone diff lube	1	\$2.50
EV5001	EV10 Video	1	\$19.99

## EVOLUTION 10 PARTS

EV0022	Front on-center steering blocks	2	\$7.99
EV0046	Graphite front axle plate	1	\$17.99
EV0060	Graphite top plate	1	\$14.99
EV0061	Graphite bottom plate	1	\$19.99
EV0067	Graphite top chassis plate	1	\$24.99
EV0077	Hollow graphite rear axle	1	\$29.99
EV0078	Aluminum diff side hub	1	\$14.99
EV0079	Aluminum left hub	1	\$14.99
EV0085	2" nylon body posts	4	\$3.99
EV0088	Aluminum steering turnbuckles	2	\$5.99

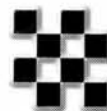
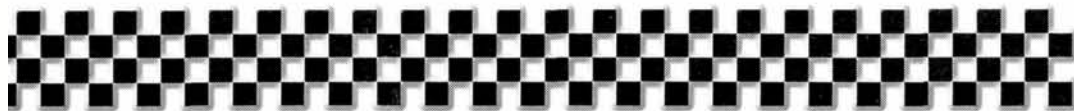
## EVOLUTION 10F PARTS

EV0200	Fiberglass On-road chassis	1	+\$29.99
EV0201	Fiberglass Front Axle Plate	1	+\$9.99
EV0202	Fiberglass Front Pivot Plate	1	+\$3.99
EV0203	Fiberglass Top Pod plate	1	+\$8.99
EV0204	Fiberglass Bottom Pod Plate	1	+\$8.99
EV0205	Fiberglass Top Chassis Plate	1	+\$11.99
EV0206	Dampner Tube	1	+\$10.99

## EV10 ON-ROAD DELUXE (EV0007) PARTS

EV0022	Front steering blocks	2	\$7.99
EV0028P	4-40 purple ball studs long	4	\$5.99
EV0033P	Purple aluminum shock body	1	\$10.99
EV0038P	Purple Shock Shaft cap	2	\$9.99
EV0046	Graphite front axle plate	1	\$17.99
EV0047P	Purple aluminum ball studs	4	\$4.99
EV0047P25	Purple ball stud bulk	25	\$24.99
EV0060	Graphite top plate	1	\$14.99
EV0061	Graphite bottom plate	1	\$19.99
EV0067	Graphite top chassis plate	1	\$24.99
EV0068P	1/4" purple aluminum pivot ball	2	\$4.99
EV0069P	3/16" purple aluminum standoff	2	\$4.99
EV0073P	1/8" purple aluminum thick washer	2	\$1.59
EV0076P	.250 purple alum control link ball	4	\$7.50
EV0080P	Purple thrust cone	1	\$1.59
EV0088P	Purple steering turnbuckles	2	\$6.99
EV0120	Lite purple clamping left hub	1	\$25.99
EV0122	Lite purple diff side hub	1	\$25.99
EV0134	On-road graphite short track chassis	1	\$79.99
EV0145	Complete micro shock purple	1	\$19.99
EV4054	8-32 purple nuts	8	\$3.99
EV0055	3/16" X 5/16" F Bearing	2	\$12.00
D1052	4-40x3/8 Cap Head Screws	12 pc	\$4.99
D1053	4-40x3/8 Flat Head Screws	12 pc	\$4.99





D1054	8-32x7/8 Flat Head Screws	6 pc	\$2.99
D1055	4-40x1/4 Cap Head Screws	12 pc	\$4.99
EV0150	2-56x1/4 Button Head Screws	12 pc	\$5.99
EV0151	8-32x5/8 Flat Head Screws	12 pc	\$4.99
EV0152	4-40x1/2 Socket Head Screws	12 pc	\$5.99
EV0153	4-40x1/2 Flat Head Screws	12 pc	\$4.99
EV0154	4-40x3/4 Socket Head Screws	12 pc	\$4.99
EV0143	4-40 Mini Lock Nuts	8 pc	\$3.50
EV0143-25	4-40 Mini Lock Nuts	25 pc	\$8.99
EV4054	8-32 Nuts	8 pc	\$3.99

## EVOLUTION 10SS PARTS

EV4000	Super speedway graphite chassis	1	\$80.00
EV4002	SS graphite bottom plate	1	\$25.00
EV4003	SS graphite front axle plate	1	\$19.99
EV4004	SS graphite top chassis plate	1	\$22.99
EV4005	SS graphite top plate	1	\$14.99
EV4007	SS graphite nerf wing	1	\$5.99
EV4008	SS aluminum diff hub	1	\$14.99
EV4009	SS aluminum left hub	1	\$14.99
EV4010	SS trailing steering blocks	2	\$7.50
EV4011	1/8" X 5/16" flanged wheel bearings	2	\$14.00
EV4012	SS hollow graphite rear axle	1	\$29.99
EV4013	SS fiberglass rear axle	1	\$19.99
EV4014	.90" X 4-40 steel turnbuckle	2	\$5.50
EV4015	1.2" X 4-40 steel turnbuckle	2	\$5.99
EV4016	3" nylon body posts	4	\$3.99
EV4017	SS aluminum steering turnbuckle	2	\$6.99
EV4018	8-32 aluminum nuts	4	\$0.99

## EV10, EV10F & EV10SS HOP-UP PARTS

EV0028P	4-40 purple ball studs long	4	\$5.99
EV0047P	Purple aluminum ball studs	4	\$4.99
EV0094	Graphite Chassis	1	\$59.99
EV0099	Progressive ft spring orange, 4-6 lb	2	\$2.00
EV0100	Progressive ft spring blue, 6-8 lb	2	\$2.00
EV0101	Progressive ft spring white, 8-10 lb	2	\$2.00
EV0102	Progressive ft spring red, 10-12 lb	2	\$2.00
EV0103	Progressive ft spring green 12-14 lb	2	\$2.00
EV0104	Progressive front spring set 2 ea size	1	\$8.00
EV0108	More Clearance Pod Plates	1	\$39.99
EV0120	Left lite purple clamping hub	1	\$25.99
EV0121	EV10SS purple aluminum diff hub	1	\$23.99
EV0122	EV10 On-road purple alum diff hub	1	\$25.99
EV0123	Micro shock spring set 3ea.	1	\$7.99
EV0125	Constant rate ft spring purple, 14 lb	2	\$2.00
EV0126	Constant rate ft spring black, 16 lb	2	\$2.00
EV0127	Constant rate ft spring green, 12 lb	2	\$2.00
EV0128	Constant rate ft spring red, 10 lb	2	\$2.00
EV0129	Constant rate ft spring white, 8 lb	2	\$2.00
EV0130	Constant rate ft spring blue, 6 lb	2	\$2.00
EV0131	Constant rate ft spring orange, 4 lb	2	\$2.00
EV0132	Constant rate ft spring set, 2 ea.	1	\$11.25
EV0133	EV10 On-road solid graphite axle	1	\$22.00
EV0135	EV10 On-road wider front axle plate	1	\$20.00
EV0136P	Extension ball studs short	4	\$6.99

EV0137P	Extension ball studs long	4	\$7.99
EV0138	Diff pinning kit	1	\$5.99
EV0139	Micro shock rebuild kit	1	\$6.99
EV0140	EV10 on-road bearing set	1	\$58.99
EV0141	Diff rebuild kit	1	\$7.99
EV0142	EV10, EV10SS Purple alum screw set	1	\$19.99
EV0143	Purple aluminum mini locknuts	8	\$3.50
EV0144	EV10, EV10SS front o-ring cup	2	\$1.99
EV0145	Complete micro shock, purple	1	\$19.99
EV0150P	1.1" purple standoff for center shock	1	\$1.99
EV0150	2-56x1/4 Button Head Screws	12 pc	\$5.99
EV0151	8-32x5/8 Flat Head Screws	12 pc	\$4.99
EV0152	4-40x1/2 Socket Head Screws	12 pc	\$5.99
EV0153	4-40x1/2 Flat Head Screws	12 pc	\$4.99
EV0154	4-40x3/4 Socket Head Screws	12 pc	\$4.99
EV1001	Antenna mount	1	\$1.29
EV4017P	Steering Turn Buckle Purple	2	\$7.99
EV4019	EV10SS sway bar kit	1	\$29.99
EV4020	EV10SS sway bar top plate	1	\$14.25
EV4021	EV10SS solid graphite axle	1	\$22.00
EV4022	Large volume shock rebuild kit	1	\$3.59
EV4023	EV10SS bearing set	1	\$58.99
EV4024	EV10SS sway bar tuning kit	1	\$14.99
EV4025	EV10SS prebent sway bar wire set	1	\$4.99
EV4030-1	Large volume shock shaft	1	\$7.99
EV4030-3P	Large volume purple shock body	1	\$9.99
EV4030-5	Large volume shock adjuster nut	2	\$2.99
EV4030-8P	Large vol shock shaft purple end cap	1	\$5.99
EV4031	Large volume shock spring .029	2	\$1.99
EV4032	Large volume shock spring .035	2	\$1.99
EV4033	Large volume shock spring .050	2	\$1.99
EV4034	Large volume shock spring .055	2	\$1.99
EV4035	Large volume shock spring .060	2	\$1.99
EV4036	Large volume shock spring set	1	\$6.25
EV4045	EV10SS lite graphite chassis	1	\$82.00
EV4046	EV10SS lite graphite bottom plate	1	\$23.99
EV4047	EV10SS lite graphite nerf wing	1	\$6.99
EV4048	EV10SS lite graphite top chassis plate	1	\$26.00
EV4049	EV10SS lite graphite chassis upgrade	1	\$137.00
EV4050	EV10SS lite left clamping hub	1	\$29.99
EV4051	EV10SS lite hub set	1	\$49.99
EV4052	EV10SS front end rebuild kit	1	\$19.99
EV4053	EV10 on-road front end rebuild kit	1	\$19.99
EV4058	Complete large volume shock purple	1	\$27.99
EV6000	Wide oval & LSD graphite chassis plate	1	\$80.00
D1052	4-40x3/8 Cap Head Screws	12 pc	\$4.99
D1053	4-40x3/8 Flat Head Screws	12 pc	\$4.99
D1054	8-32x7/8 Flat Head Screws	6 pc	\$2.99
D1055	4-40x1/4 Cap Head Screws	12 pc	\$4.99

## EV10 LEFT SIDE DRIVE CONVERSION PARTS

EV6004	EV10 LSD conversion top plate	1	\$16.59
EV6005	EV10 LSD conversion bottom plate	1	\$24.99
EV6010	EV10 LSD solid graphite rear axle	1	\$23.99
EV6011	EV10 LSD aluminum diff side hub	1	\$13.99
EV6012	6-32 nylon locknut	4	\$0.99
EV6013	EV10 LSD sway bar kit	1	\$14.99
EV6014	EV10 LSD prebent sway bar wires	1	\$3.49





## **REVOLVER 22j & MAGIC CARPET RIDE COMMON PARTS**

D1050	2-56 Ball cups	4	\$3.39
D1052	Purple alum 4-40 X 3/8" cap screw	12	\$4.99
D1053	Purple alum 4-40 X 3/8 flathead	12	\$4.99
D1055	Purple alum 4-40 X 1/4" cap screw	12	\$4.99
EV0024	Front upper mounts	2	\$4.50
EV0029	4-40 steel locknuts	4	\$0.99
EV0030	Nylon ball cups	4	\$2.99
EV0031	Delrin balls	2	\$1.99
EV0033P	Purple micro shock body	1	\$10.99
EV0034	Micro shock cylinder nut	2	\$2.50
EV0035	Micro shock 1/16" silicone o-ring	4	\$0.99
EV0036N	Micro shock nylon adjuster nut	2	\$2.89
EV0037	Micro shock pressurization spring	4	\$2.99
EV0038P	Purple alum shock shaft end cap	1	\$9.99
EV0039	Micro shock shaft	2	\$9.99
EV0040	Micro shock shaft brass washer	4	\$0.99
EV0041	Shock spring 5 lb	2	\$2.00
EV0042	Shock spring 11 lb	2	\$2.00
EV0043	Shock spring 15 lb	2	\$2.00
EV0044	Shock spring 23 lb	2	\$2.00
EV0047P	Purple aluminum ball studs	4	\$4.99
EV0050	8-32 nylon nut	4	\$0.99
EV0052	Nylon clevis	2	\$1.99
EV0056	1/4 X 3/8" unflanged bearing	1	\$7.50
EV0057	1/4 X 3/8" flanged bearing	2	\$14.00
EV0058	1/4" X 1/8" steel washer	4	\$0.99
EV0059	1/8" E-clips	12	\$1.29
EV0065	4-40 X 3/8" cap screws	8	\$1.29
EV0072	Nylon pivot ball socket set	2	\$1.99
EV0080P	Purple thrust cone	1	\$1.59
EV0081	Belleville washers	4	\$1.99
EV0082	Rear axle shim set	1	\$1.99
EV0085	2" body posts	4	\$2.99
EV0086	Body post collars	4	\$3.99
EV0087	4-40 X 1/8" set screws	8	\$1.29
EV0090	Bent up body clips	6	\$2.99
EV0091	Rear ride height adjuster set	1	\$2.69
EV0092	1/8" Differential balls	12	\$2.99
EV0093	Diff rings	2	\$2.99
EV0143	Purple alum mini locknuts	8	\$3.50
EV0151	Purple 8-32 X 5/8" flat heads	12	\$4.99
EV0153	Purple 4-40 X 1/2" flat heads	12	\$4.99
EV0154	Purple 4-40 X 3/4" cap screw	12	\$4.99
EV4011	1/8" X 5/16" Flanged bearing	2	\$14.00
EV4012	Hollow graphite axle	1	\$29.99
EV4016	3" nylon body posts	4	\$3.99
MM2000	1/4" ID thin axle shims	10	\$1.99
RE1001	Front kingpins	2	\$1.99
RE1002	Steering blocks	2	\$6.99
RE1003	1.6" turnbuckles	2	\$6.99
RE1009	"T" bar spacer	1	\$2.99
RE1014P	Purple pivot ball	2	\$4.99
RE1016P	1.390" Purple standoff	1	\$2.99

RE1028	Long "T" bar	1	\$7.99
RE1028-1	2-56 x 1/4" Flat Head screws	10	\$1.99
RE1032	Purple left side bulkhead	1	\$13.50
RE1033	Purple right side bulkhead	1	\$19.99
RE1034	Clamping left purple aluminum hub	1	\$17.99
RE1035	Purple alum diff side hub	1	\$15.99
RE1037	Lite graphite bottom plate	1	\$11.99
RE1038	Graphite upper plate	1	\$10.99
RE1039	Dampener Tube	1	\$10.99
RE1041	Female dampener tube pivot ball	1	\$3.99
RE1042	4-40 X 1/2" set screw	1	\$0.99
RE1043	6 Cell graphite chassis plate	1	\$50.99
RE1044	Purple 4-40 X 1/4" flat head	12	\$5.99
RE7742	4-40 x 3/4 screws	4	\$1.99
RE7750P	.750" purple alum standoff	1	\$2.99

## **REVOLVER 22j PARTS**

EV4014	4-40 X .9" steel turnbuckles	2	•\$5.50
EV0053	Nylon front axle spacer set	1	•\$3.59
EV4054	Purple 8-32 aluminum nuts	8	•\$3.99
RE1004	Front Springs	2	•\$1.99
RE1031	Front kingpin bushings	2	•\$1.99
RE1036	Lite graphite front axle plate	1	•\$10.99

## **MAGIC CARPET RIDE PARTS**

RE1045	Front shock pins	2	\$1.99
RE1046	.650" steel turnbuckles	4	\$4.99
RE1047	.093 front sway bar wire	1	\$1.99
RE1048	Front sway bar mounts	2	\$1.49
RE1050	Nylon left & right a-arms	1	\$4.99
RE1051	.093" pivot pins	2	\$1.39
RE1052	Nylon front bulkheads	2	\$2.49
RE1053	.078" front sway bar wire	1	\$1.99
RE1054	4-40 X 1" flat head	4	\$2.99

## **REVOLVER 22j HOP UP PARTS**

RE1008	"T" bar	1	\$5.99
RE1015P	.850" purple alum standoff	2	\$2.99
RE1017	Graphite rear chassis brace 12SS	1	\$9.50
RE1018	Dampener tube	1	\$10.99
RE1020	Graphite super speedway chassis	1	\$55.50
RE1021	Graphite SS nerf wing	1	\$3.99
RE1026	"Orlando" "T" bar	1	\$6.99
RE1029	"T" bar tuning kit	1	\$17.97
RE1030	King pin bushing with drill	1	\$1.99
RE1040	Magic 4-cell graphite chassis	1	\$49.99
RE1055	Front spring .018 black	2	\$1.99
RE1056	Front spring .022 nickel	2	\$1.99
RE1057	Front spring .024 gold	2	\$1.99
RE1058	Front spring set, 2 ea size	1	\$4.99
RE1070	Ball Bearing Set	1	\$58.99



## DRAGWORKS CAR PARTS

D1001	Funny car chassis 14" wb	1	\$94.99
D1002	Pro stock chassis 11" wb	1	\$79.99
D1004	Lower pod plate	1	\$12.99
D1005	Upper pod plate	1	\$6.99
D1006	Purple alum left bulkhead	1	\$13.50
D1007	Purple alum right bulkhead	1	\$19.99
D1013	4.5" front axle beam	1	\$8.99
D1014	Front kingpins	2	\$4.99
D1017	Clamping front block	1	\$5.99
D1018	Floating front block	1	\$5.99
D1019	Front axle beam	1	\$7.99
D1020	Graphite rear axle	1	\$7.99
D1021	Right rear gear hub	1	\$29.99
D1025	2" front wheel w/"O" rings	2	\$6.99
D1026	Front wheel "O" rings	2	\$1.99
D1027	4-40 pull rod 12"	1	\$1.99
D1030	1.250" X .250" alum standoff	1	\$1.99
D1031	2-56 turnbuckles	2	\$4.59
D1033	6" silicone tubing	1	\$1.69
D1034	Rear engine conversion plate	1	\$19.99
D1040	1" P/S Front body mount plate	1	\$6.29
D1042	1.75" F/C body mount plate	1	\$7.39
D1047	3/32" set screw collars	1	\$1.29
D1048	2-56 ball studs steel	4	\$2.99
D1049	2-56 mini locknuts	8	\$3.39
D1050	2-56 ball cups	8	\$3.79
D1051	5-40 lock nuts	8	\$0.99
D1052	4-40 X 3/8" cap screw	12	\$4.99
D1053	4-40 X 3/8 flat heads	12	\$4.99
D1054	8-32 X 7/8" flat heads	6	\$2.99
D1055	4-40 X 1/4" cap screw	12	\$4.99
EV0030	Nylon ball cups	4	\$2.99
EV0047P	4-40 purple alum ball stud	4	\$4.99
EV0050	8-32 nylon locknut	4	\$0.99
EV0057	1/4" X 3/8" flanged bearing	2	\$14.00
EV0064	4-40 X 3/8" flat heads	8	\$0.99
EV0065	4-40 X 3/8" cap screw	8	\$0.99
EV0071	2-56 X 1/4" buttonheads	8	\$1.99
EV0072	Nylon pivot ball socket set	1	\$1.99
EV0082	Axle shim set	1	\$1.99
EV0085	2" nylon body posts	4	\$3.99
EV0086	Body post collars	4	\$3.99
EV0087	4-40 X 1/8" set screws	8	\$1.29
EV0090	Bent up body clips	6	\$2.99
EV0091	Ride height adjusters	1	\$2.69
EV0143	4-40 purple mini locknuts	8	\$3.50
EV4011	1/8" X 5/16" flanged bearings	2	\$14.00
EV4050	Clamping left purple alum hub	1	\$29.99
R7714	4" nylon body posts	2	\$4.00
RE1002	Front steering blocks	2	\$6.99
RE1004	Front springs .020	2	\$1.99
RE1008	"T" bar	1	\$5.99
RE1009	"T" bar spacer	1	\$2.99
RE1014P	Purple alum pivot balls	2	\$4.99

## STREET SPEC PARTS

SS2000	S Spec Blue Front Tires, pair, as in kit	1	\$10.99
SS2001	S Spec Green Rear Tires, pair, as in kit	1	\$11.49
SS2002	"T" bar/bottom pod plate	1	+\$8.99
SS2003	Upper chassis battery plate	1	+\$8.99
SS2004	Front axle plate	1	+\$7.99
SS2005	Chassis plate	1	+\$21.99
SS2006	Pivot plates	2	+\$5.99
SS2007	Top plate	1	+\$6.99
SS2008	1/8" X 5/16" flanged bushing	4	\$1.99
SS2009	5-40 flat nuts	2	\$0.99
SS2010	Front kingpins	2	\$2.99
SS2011	Dampener washers	2	\$0.99
SS2012	Silicone Tubing	1	\$1.69
SS2013	Nylon left hub	1	\$4.29
SS2014	Thrust bearing set	1	\$2.59
SS2015	1/4" X 3/8" bushing	2	\$1.49
SS2016	Steel rear axle	1	\$9.99
SS2017	4-40 threaded rod	2	\$1.99
SS2018	1994 short track T-bird body	1	\$15.99
SS2019	Touring car chassis	1	\$19.99
SS2020	5-40 x 3/8" cap screw	4	\$0.99
SS2021	Complete Ball Bearing Set	1	\$45.99
SS2022	Battery "O" rings	2	\$1.29
SS2100	S Spec Green Front Tires, pair	1	\$10.99
SS2101	S Spec Orange Front Tires, pair	1	\$10.99
SS2102	S Spec Blue Rear Tires, pair	1	\$11.49
SS2232	BMW Touring body	1	\$15.99
SS2233	Touring Green Rear Tires, pair	1	\$11.49
SS2234	Touring Blue Rear Tires, pair	1	\$11.49
SS2235	Touring Green Front Tires, pair	1	\$10.99
SS2236	Touring Blue Front Tires, pair	1	\$10.99
SS2237	Touring Orange Front Tires, pair	1	\$10.99
SS2238	Opel Calibra body	1	\$15.99
SS2239	Street Spec sticker sheet	1	\$3.99
SS2242	C type speedway truck body	1	\$15.99
D1027	4-40 dampener rod	1	\$1.29
D1030	1.25" standoff w/hole	1	\$1.99
D1033	Silicone tubing	1	\$1.69
D1047	3/32" set collars	2	\$1.29
D1051	5-40 steel locknuts	8	\$0.99
EV0025	Front springs	2	\$2.00
EV0029	4-40 locknuts	4	\$0.99
EV0030	Nylon ball cups	4	\$2.99
EV0047	Aluminum ball studs	4	\$3.99
EV0048	Aluminum mini locknuts	8	\$2.99
EV0049	8-32 X 7/8" flat heads	4	\$1.49
EV0050	8-32 nylon locknuts	4	\$0.99
EV0053	Nylon front axle spacer set	1	\$3.59
EV0054	1/8" silicone o ring	4	\$0.99
EV0057	1/4" x 3/8" flanged bearing	2	\$14.00
EV0058	1/8" x 1/4" steel washers	4	\$0.99
EV0059	1/8" e-clips	12	\$1.29
EV0062	Nylon left bulkhead	1	\$1.99
EV0063	Aluminum right bulkhead	1	\$14.99
EV0064	4-40 X 3/8" flatheads	8	\$0.99
EV0065	4-40 X 3/8" cap screws	8	\$0.99
EV0073	1/8" aluminum spacer	2	\$0.99





**SLOT CARS  
MOTORS  
RTR'S**



EV0074	4-40 X 1/2" flatheads	8	\$0.99
EV0081	Belleville washers	4	\$1.99
EV0082	Nylon axle shim set	1	\$1.99
EV0086	Nylon body post collars	4	\$2.99
EV0087	4-40 X 1/8" set screws	8	\$1.29
EV0090	Bent up body clips	6	\$2.99
EV0091	Ride height adjuster set	1	\$2.69
EV0092	Differential balls	12	\$2.99
EV0093	Diff rings	2	\$2.99
EV0110	Silicone diff lube	1	\$2.50
EV1001	Antenna mount	1	\$1.29
EV1002	10-32 set screws	2	\$0.99
EV4008	Aluminum diff hub	1	\$14.99
EV4010	Trailing steering arms	2	\$7.50
EV4016	3" nylon body posts	4	\$3.99
RE1004	Front springs	2	\$1.99
RE1015	.850" standoff	2	\$1.99
RE1054	4-40 X 1" flatheads	2	\$2.99
R7714	4" nylon body posts	2	\$4.00
RE7750	.750" standoff	2	\$2.99

### For The Latest Street Spec Rule Book Send \$3.00 To:

Rule Book  
c/o Trinity Products Inc.  
1901 E. Linden Ave #8  
Linden, NJ 07036



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## SLOT CAR RACING MOTORS

### 1995-96 VERSION 16-D MOTORS



All Trinity Slotworks motors are designed with the latest technology for Group 10 class racing. Only the highest quality components are used to insure you the best performance and reliability. All Trinity Slotworks motors are built to meet Parma Challenge Cup Rules. These motors fit all Group 10 (flexi type) cars made by Trinity, Parma, JK, Champion etc..

S9500	"Green Machine 24" Un-balanced, green end bell	1ea	\$11.50
S9501	"James Brown" Balanced, brown endbell	1ea	\$12.50
S9502	2% Team Stock, hand picked, unbalanced	1ea	\$15.50
S9503	2% Team Outlaw Stock, hand picked, balanced	1ea	\$17.50

S1002	Home-Set, 16-D motor, for home sets/rentals	1ea	\$9.00
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### 16-D ARMATURES

S9504	Un-balanced 16-d armature	1ea	\$5.50
S9505	Balanced 16-d armature	1ea	+\$7.25
S9506	Un-balanced armature with cut comm	1ea	-\$7.75
S9507	Balanced Armature with cut comm	1ea	+\$9.75

### MOTOR BRUSHES AND SPRINGS

S1020	16-D Motor Springs	6pr	\$2.70
S1018	16-D Motor Brushes, improved compound,	6pr	\$6.00
S1018B	16-D Motor Brushes,	50pr	\$45.00
S9700	16-D Brushes and Springs	6pr	•\$9.00
S9701	16-D Brushes and Springs	50pr	•\$65.00
S2000	E Brush 36-D Brush 15, 27 and 7 racing	6pr	\$9.54
S2001	E Brush Bulk	100pr	\$129.00
S2009	Bigger Coil 16-D springs, fit S2008 posts	6pr	\$3.30
S2009B	Bigger Coil springs bulk, fit S2008 posts	50pr	\$25.00
S2010	Spring Post Conversion kit 1 pr 2008, 2009	1ea	\$0.99

### 16-D MOTOR PARTS

S9508	Complete Un-balanced Setup, green endbell	1ea	\$7.75
S9509	Complete Balanced Setup, brown endbell	1ea	\$8.75
S9510	Replacement Un-Balanced 16-D Endbell, green	1ea	\$3.00
S9511	Replacement Balanced 16-d Endbell, brown	1ea	\$3.00
S9512	Motor and Can Bushings,	6pr	\$5.00
S1006	16-D Motor Can	1ea	+\$3.00
S1011	Outlaw Magnets W/Clips	1pr	\$3.75
S1012	Spyder Magnets W/Clips	1pr	\$2.75
S1024	Outlaw Flat Magnet Clips	6pr	\$3.00
S1025	Spyder Wire Magnet Clips	6pr	\$3.00
S1021	Motor Brush Hoods	6pr	\$2.70
S1022	Motor Brush Back Plates	6pr	\$2.70
S1014	Armature Spacers,	6pcs	\$0.75
S1014B	Armature Spacers	100pcs	\$9.00
S1026	Motor Hex Head Screws	24pcs	\$4.80
S2008	Spring Posts, use S2009 springs	6pr	\$3.54

# TRINITY



## READY TO RUN CARS

### 4" UNBALANCED MOTORS

S1200A Spyder RTR flexi type, L-Type stocker body	1ea	+\$33.99
S1200B Spyder RTR flexi type, T-Type stocker body	1ea	+\$33.99
S1200C Spyder RTR flexi type, Pontiac stocker body	1ea	+\$33.99
S1200H Spyder RTR Flexi type, OutLaw Kremer body	1ea	+\$33.99

### 4" BALANCED MOTORS

S1201A Pro Outlaw RTR flexi type, L-Type stocker	1ea	+\$35.99
S1201B Pro Outlaw RTR flexi type, T-Type stocker	1ea	+\$35.99
S1201C Pro Outlaw RTR flexi type, Pontiac stocker	1ea	+\$35.99
S1201H Pro Outlaw RTR flexi type, Kremer body	1ea	+\$35.99

### 4.5" STOCK CARS/TRUCKS-UNBALANCED

S1202B 4.5" T-Type Stock Car RTR	1ea	+\$42.99
S1202C 4.5" Pontiac Stock Car RTR	1ea	+\$42.99
S1202D 4.5" 1995 M-C Stock Car RTR	1ea	+\$42.99
S1202E 4.5" 1995 C-Type Speedway Truck	1ea	+\$42.99
S1202F 4.5" 1995 F-Type Speedway Truck	1ea	+\$42.99

### 4.5" STOCK CARS/TRUCKS-BALANCED

S1203B 4.5" T-Type Stock Car RTR	1ea	+\$46.99
S1203C 4.5" Pontiac Stock Car RTR	1ea	+\$46.99
S1203D 4.5" 1995 M-C Stock Car RTR	1ea	+\$46.99
S1203E 4.5" 1995 C-Type Speedway Truck	1ea	+\$46.99
S1203F 4.5" 1995 F-Type Speedway Truck	1ea	+\$46.99

## SPEEDWAY SERIES READY TO RUNS

These RTR's feature the all new Spyder 2000 pro designed chassis for superior handling. The bodies come painted in NASCAR type color schemes and come with vinyl numbers installed.

### 4" UNBALANCED MOTORS

S9670 L-Type Speedway RTR	1ea	•\$39.99
S9671 T-Type Speedway RTR	1ea	•\$39.99
S9672 Pontiac Speedway RTR	1ea	•\$39.99

### 4" BALANCED MOTORS

S9673 L-Type Speedway RTR	1ea	•\$41.99
S9674 T-Type Speedway RTR	1ea	•\$41.99
S9675 Pontiac Speedway RTR	1ea	•\$41.99

### 4.5" STOCK CARS/TRUCKS-UNBALANCED

S9676 4.5" T-Type Speedway RTR	1ea	•\$49.99
S9677 4.5" Pontiac Speedway RTR	1ea	•\$49.99
S9678 4.5" 1995 M-C Speedway RTR	1ea	•\$49.99
S9679 4.5" 1995 C-Type Speedway Truck RTR	1ea	•\$49.99
S9680 4.5" 1995 F-Type Speedway Truck RTR	1ea	•\$49.99

### 4.5" STOCK CARS/TRUCKS-BALANCED

S9681 4.5" T-Type Speedway RTR	1ea	•\$52.99
S9682 4.5" Pontiac Speedway RTR	1ea	•\$52.99
S9683 4.5" 1995 M-C Speedway RTR	1ea	•\$52.99
S9684 4.5" 1995 C-Type Speedway Truck RTR	1ea	•\$52.99
S9685 4.5" 1995 F-Type Speedway Truck RTR	1ea	•\$52.99

## GTP READY TO RUNS

3/32 axles and tires, Spyder 2000 4" chassis, silicone lead wire w/clips

S9640 GTP Style RTR, balanced motor	1ea	•\$51.99
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## GROUP 12 RTR'S

S9641 Spyder 2000 4" chassis, Mura motor/air dams	1ea	•\$57.00
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## READY TO ROLLS

### RTR'S WITH OUT BODIES

S9620 Spyder 2000 4" chassis, unbalanced motor	1ea	•\$35.99
S9621 Spyder 2000 4" chassis, balanced motor	1ea	•\$38.99
S9622 Spyder 2000 4" chassis, Mura Gp 12 motor	1ea	•\$52.00
S9623 GTP Style, Spyder 2000 4" chassis, balanced motor	1ea	•\$46.99
S9624 Stocker 2000 4.5" chassis, unbalanced motor	1ea	•\$44.99
S9625 Stocker 2000 4.5" chassis, balanced motor	1ea	•\$48.99

## CAR KITS

S9627 Spyder 2000 4", unbalanced motor, no body	1ea	•\$32.00
S9628 Spyder 2000 4", balanced Motor, no body	1ea	•\$35.00
S9629 GTP, Spyder 2000 chassis, balanced motor, no body	1ea	•\$48.00
S9630 Stocker 2000 4.5", unbalanced motor, no body	1ea	•\$41.00
S9631 Stocker 2000 4.5", balanced motor, no body	1ea	•\$45.00

## STARTER KITS

CAR, CONTROLLER, PITBOX, ALLEN WRENCH, OILER, STICKERS

### UNBALANCED MOTORS

S5000 L-Type Group 10 unbalanced starter set	1ea	+\$80.99
S5001 Pontiac Group 10 unbalanced starter set	1ea	+\$80.99
S5002 T-Type Group 10 unbalanced starter set	1ea	+\$80.99
S1205A 4.5" L-Type Stock Car unbalanced starter set	1ea	+\$95.99
S1205B 4.5" T-Type Stock Car unbalanced starter set	1ea	+\$95.99
S1205C 4.5" Pontiac Stock Car unbalanced starter set	1ea	+\$95.99
S1205D 4.5" Speedway Truck started kit	1ea	+\$95.99

### BALANCED MOTORS

S5010 L-Type Outlaw balanced starter set	1ea	+\$84.99
S5011 Pontiac Outlaw balanced starter set	1ea	+\$84.99
S5012 T-Type Outlaw balanced starter set	1ea	+\$84.99
S1206A 4.5" L-Type Stock Car balanced starter set	1ea	+\$98.99
S1206B 4.5" T-Type Stock Car balanced starter set	1ea	+\$98.99
S1206C 4.5" Pontiac Stock Car balanced starter set	1ea	+\$98.99
S1206D 4.5" Speedway Truck balanced motor starter	1ea	+\$98.00

### GROUP 12 MOTORS

S1950 Group 12 starter set	1ea	+\$106.00
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All starter sets are available with Negative Gate SpeedGun controls, just add an "N" after the part number and \$5.00 to the list price.

## CONTROLLERS

All Trinity Slotworks controllers are an electronic diode design that was engineered especially for group 10 and 12 class racing. Controller power slope is easy to modify for different track and driving conditions.

S1300 SpeedGun Controller, group 10/12 positive wired	1ea	+\$47.00
S1301 SpeedGun Controller group 10/12 negative wired	1ea	+\$52.99
S1306 SpeedGun Group 10 Pro, positive wired	1ea	+\$68.00
The Pro model has super flexible 12 awg leads, floating wiper button, anodized purple aluminum finned heatsink etc.		
S1307 SpeedGun Group 10 Pro, negative wired	1ea	+\$71.00



## CONTROLLER PARTS

S3000	Clear SpeedGun Lexan Handle	1ea	\$8.00
S1305	Painted Lexan SpeedGun Handle	1ea	+\$13.99
S3001	Assembled Circuit Board	1ea	\$16.00
S3013	Negative Gate Assembled Circuit Board	1ea	\$18.50
S3010	Replacement Semiconductor	1ea	\$0.99
S3011	Heatsink For Semiconductors	1ea	\$4.99
S1304	Purple Anodized Finned Heatsink	1ea	\$8.99
S3002	Wiper arm	1ea	\$2.99
S3003	Wiper Button	6pc	\$5.94
S3012	Bi Metallic Floating Wiper Button, soft face	6pc	\$5.94
S3004	Screw Set	1 ea	\$2.99
S3005	Springs	6 pcs	\$3.60
S3007	Trigger	1 ea	\$2.99
S3008	Bushing & Washer,	6 set	\$3.00
S3014	Gold power and brake posts with nuts	1 pr	\$1.99

## CONTROLLER WIRE

S3009	16 AWG Wire, 3' each color, red, black, white	1set	\$4.99
S1302	Controller Wire 12 Awg, flourescent pink	15 1ea	\$9.99
S1303	Controller Wire 12 Awg, flourescent green	15 1ea	\$9.99
S3006	Clips W/Boots, heavy duty copper, R,B,W	1set	\$6.99

## CLEAR BODIES

### 4" CLEAR BODIES

S1428	94 T-Type Body	1ea	\$3.99
S1430	94 L-Type Body	1ea	\$3.99
S1432	94 Pontiac Body	1ea	\$3.99
S1434	Outlaw Kremer Body w/molded in wings	1ea	\$3.99
S1442	Outlaw Kremer without wings	1ea	\$3.99
S1900	Sthemo GTP Body, "Scale"	1ea	\$3.99
S1901	Lotec GTP Body, "Scale"	1ea	\$3.99
S1902	Kremer GTP Body, "Scale"	1ea	\$3.99

All clear bodies are available in trimmed versions. Just add a "T" after the part number. \$4.99 each.

### 4.5" CLEAR CAR/TRUCK BODIES

S1436	4.5" 1994 L-Type	1ea	\$3.99
S1438	4.5" 1994 T-Type	1ea	\$3.99
S1440	4.5" 1994 Pontiac	1ea	\$3.99
S1943	4.5" 1995 M-C	1ea	\$3.99
S1450	4.5" 1995 Clear Chevy Truck	1ea	\$3.99
S1452	4.5" 1995 Clear Ford Truck	1ea	\$3.99

## PAINTED BODIES

### 4" PAINTED BODIES

S1429	94 T-Type Body	1ea	\$6.99
S1431	94 L-Type Body	1ea	\$6.99
S1433	94 Pontiac Body	1ea	\$6.99
S1435	Outlaw Kremer Body	1ea	\$6.99
S1443	Outlaw Kremer without wings	1ea	\$6.99
S1903	Sthemo GTP Body	1ea	\$6.99
S1904	Lotec GTP Body	1ea	\$6.99
S1905	Kremer GTP Body	1ea	\$6.99

### 4.5" PAINTED CAR/TRUCK BODIES

S1437	4.5" 1994 Painted L-Type	1ea	\$6.99
S1439	4.5" 1994 Painted T-Type	1ea	\$6.99
S1441	4.5" 1994 Painted Pontiac	1ea	\$6.99
S1945	4.5" 1995 Painted M-C Type	1ea	\$6.99
S1451	4.5" 1995 C-Type Truck	1ea	\$6.99
S1453	4.5" 1995 F-Type Truck	1ea	\$6.99

All Painted bodies are available in trimmed versions. Just add a "T" after the part number. \$7.99 each.

## BRAID

S1536	Standard Racing Braid	100pr	\$32.00
S1527	Pro Competition 432 Braid	100pr	\$36.00

## CHASSIS & CHASSIS PARTS

### SPYDER CHASSIS

S1501	4" Spyder Chassis	1ea	\$10.99
S2200	GTP Short Pan Spyder Chassis	1ea	\$12.99

### NEW!!

### SPYDER 2000 CHASSIS

S9604	Spyder 2000, 4" Group 10 chassis	1ea	•\$14.99
S9605	Stocker 2000, 4.5" stock car chassis	1ea	•\$16.99

## CHASSIS CENTERS AND PANS

### SPYDER CHASSIS

S1734	Spyder chassis replacement center section	1ea	\$5.99
S1735	Spyder chassis pan section, with loop	1ea	\$5.99
S1735A	Spyder chassis pan section, no loop	1ea	\$5.99
S2201	GTP Short Pans	1ea	\$6.99
S1543	4.5" Stock Car Extender, for Spyder Chassis	1set	\$3.99
S1546	Long Stock Car Pans	1set	\$6.99
S1547	Short Stock Car pans	1set	\$6.99

### NEW!!

### CHASSIS CENTERS AND PANS

### SPYDER 2000 CHASSIS

S9606	Spyder 2000 4" replacement center section	1ea	•\$7.99
S9607	Spyder 2000 4" replacement pans	1ea	•\$7.50
S9608	Stocker 2000 4.5" replacement center section	1ea	•\$8.99
S9609	Stocker 2000 4.5" replacement pans	1ea	•\$8.50

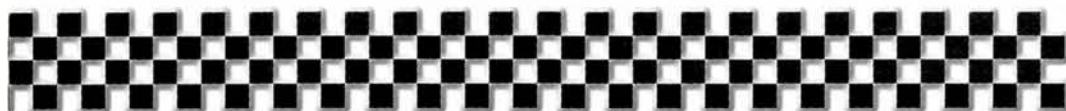
## CHASSIS HARDWARE

S1538	Front Chassis Hinge Wire	6pcs	\$3.00
S1524	Wheel Spring Retainers	10pr	\$3.00
S1524B	Wheel Spring Retainers, bulk 100 pr in tube	100pc	\$27.00
S1530	Spyder Front Axle	6pcs	\$3.00
S1529	Front Axle Spacers, 1/16" ID	10pcs	\$0.99
S1529B	Front Axle Spacers	100pcs	\$8.99
S1732	1/8 Axle Shims, precision thin axle shims	20pcs	\$3.50
S1732B	1/8 Axle Shims	100pc	\$14.99
S1559	Body Clips	6pr	\$1.99
S1559B	Body Clips	100pr	\$27.50
S9610	Front Chassis Hinge Wire Spyder 2000	6 pcs	\$3.00
S9611	Front Chassis Hinge Wire Stocker 2000	6 pcs	\$3.00

## BUSHINGS & BEARINGS

S1558	1/8 Oilites	6pr	\$4.20
S1558B	1/8 Oilites	50pr	\$30.00
S2208	1/4 x 3/32 Rear Axle Oilites	6pr	\$7.50
S2208B	1/4 x 3/32 Rear Axle Oilites	25pr	\$27.50
S2202	1/4 X 1/8" Ball Bearings, fits rear of Group 10	1pr	\$13.99
S9600	Square Bushings for 1/8" Axle, Trinity/Parma	1pr	•\$1.00
S9601	Square Bushing for 1/8" Axle, bulk	50pr	•\$40.00





## AXLES

S1504	Drill Blank 1/8 Axle	1ea	\$1.99
S2207	3/32 Drill Blank Axle	6pcs	\$10.80
S9602	1/8" Independent Ft Axle for 4.5" NASCAR	1ea	•\$1.75

## FRONT WHEELS/TIRES

S1539	1/2" Front Wheels & Tires	1pr	\$2.99
S2212	5/8" Aluminum GTP Front Wheel, 1 pr with O rings	1pr	\$2.99
S2213	Replacement Front O rings For 5/8 Front	6pr	\$2.99
S9603	Front NASCAR Front Wheel/Tire, black foam	1 pr	\$4.50

## PRESS ON PINIONS

S1570	8 Tooth 48 Pitch Press On Brass Pinion	6pcs	\$3.30
S1570B	8 Tooth Pinion Bulk	50pcs	\$22.00
S1571	9 Tooth 48 Pitch Press On Brass Pinion	6pcs	\$3.30
S1571B	9 Tooth Pinion Bulk	50pcs	\$22.00
S1572	10 Tooth 48 Pitch Press On Brass Pinion	6pcs	\$3.30
S1572B	10 Tooth Pinion Bulk	50pcs	\$22.00
S1573	11 Tooth 48 Pitch Press On Brass Pinion	6pcs	\$3.30
S1573B	11 Tooth Pinion Bulk	50pcs	\$22.00
S1574	12 Tooth 48 Pitch Press On Brass Pinion	6pcs	\$3.30
S1574B	12 Tooth Pinion Bulk	50pcs	\$22.00

## SPUR GEARS

S1519B	28 Tooth Gears	25pcs	\$37.10
S1520B	29 Tooth Gears	25pcs	\$37.10
S1521B	30 Tooth Gears	25pcs	\$37.10
S1522B	31 Tooth Gears	25pcs	\$37.10
S1523B	32 Tooth Gears	25pcs	\$37.10
S1542B	33 Tooth Gears	25pcs	\$37.10
S1537B	34 Tooth Gears	25pcs	\$37.10

## GUIDES

S1505	Guide Flag Threaded With Nut	1ea	\$0.80
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## GUIDE SPACERS

S1733	Guide Flag Spacers, thin precision steel	10pcs	\$3.00
S1733B	Guide Flag Spacers	100pc	\$28.00
S2209	.005 Teflon Guide Washers	10pcs	\$0.89
S2209B	.005 Teflon Guide Washers	100pc	\$7.99
S2210	.015 Teflon Guide Washers	10pcs	\$0.89
S2210B	.015 Teflon Guide Washers	100pc	\$7.99
S2211	.020 Steel Guide Washers	10pcs	\$0.89
S2211B	.020 Steel Guide Washers	100pc	\$7.99

## LEAD WIRE

S1509	18 Awg Wire On Clips	1pr	\$1.50
S1510	18 Awg Wire 10 Foot	1ea	\$5.50
S1511	14 Awg Wire 10 Foot, 5 foot each black/red	1set	\$7.50

## OIL AND LIQUIDS

TK2000	Formula '96 Motor Drops	1 ea	•\$4.99
S1513	Speed Drops, commutator drops	1ea	\$3.99
S1550	Group 10/15 Bushing Oil	1ea	\$3.49
S1551	Group 7/27 Ball Bearing Oil	1ea	\$3.49
S2203	Braid Slick, 2 ounces increases braid contact	1ea	\$1.29
S2203B	Braid Slick Bulk	6pcs	\$6.60
S2204	Braid Slick 8 ounce refill	1ea	\$3.89

## SCREWS

S1525	Motor Mounting Screws	6pr	\$3.00
S1525B	Motor Mounting Screws	100pr	\$45.00
S1540	4/40 Set Screws	10pcs	\$1.00
S1540B	4/40 Set Screws	100pcs	\$9.00

## SHIRTS/STICKERS/BAGS

S1531	4 Color Slot Works Sticker Sheet	1ea	\$3.99
S1532	Slot Works Shirt small	1ea	+\$20.00
S1533	Slot Works Shirt, medium	1ea	+\$20.00
S1534	Slot Works Shirt, large	1ea	+\$20.00
S1535	Slot Works Shirt, x-large	1ea	+\$21.00
S1556	Slot Works Shirt, xx-large	1ea	+\$22.00
S1555	Slotworks Logo Hauler Bag, purple	1ea	+\$24.99

## TIRES

.790 x 1/8			
S1600	P7 Mini Roller .790 x 1/8 Black Rubber	1ea	\$4.50
S1603	P7 Mini Roller .790 x 1/8 Orange Rubber	1ea	\$4.50
S1607	P7 Mini Roller .790 x 1/8 Red Rubber	1ea	\$4.50
S1610	P7 Mini Roller .790 x 1/8 Dark Blue Rubber	1ea	\$4.50
S1611	P7 Mini Roller .790 x 1/8 Light Blue Rubber	1ea	\$4.50
S1612	P7 Mini Roller .790 x 1/8 Tan Rubber	1ea	\$4.50
13/16 x 1/8			
S1620	P7 Mini Roller 13/16 x 1/8 Yellow Rubber	1ea	\$4.50
3/32 Axle Rear Tires			
S1641	13/16 x 3/32 MiniRoller Black Rear Tires	1ea	\$4.50
S1642	.790x 3/32 MiniRoller Black Rear Tires	1ea	\$4.50

## TOOLS

S1514	Comm Cleaner commutator cleaning tool	1ea	\$4.99
S1557	Braid/Chassis Cleaning Wire Brush	1ea	\$4.99
S1561	.050 Pro Wrench W/Drill Blank Tip	1ea	\$8.50
S1562	Replacement .050 Tip	1ea	\$4.50
S1563	Replacement .050 Tips, 6 pieces	6pcs	\$25.50
S1564	Pit Box With Handle, assorted colors	1ea	\$7.99
S1590	4/40 (.050) Allen Wrenches	6pcs	\$1.80
S1590B	4/40 (.050) Allen Wrenches	100pc	\$20.00
S1591	Group 10 Armature Tubes	10pcs	\$2.99
S1592	Motor Boxes W/Foam	4 pcs	\$2.99
S1593	Pit Packs, includes guide, braid, clips, allen wrench	1ea	\$5.99

Trinity/Slotworks cars, controllers and parts are only available through your local Slot Car Raceway. Support your local Raceway!





PHOTOS BY RICK SCHWARTZ

# 1995 ROAR On-Road Nationals



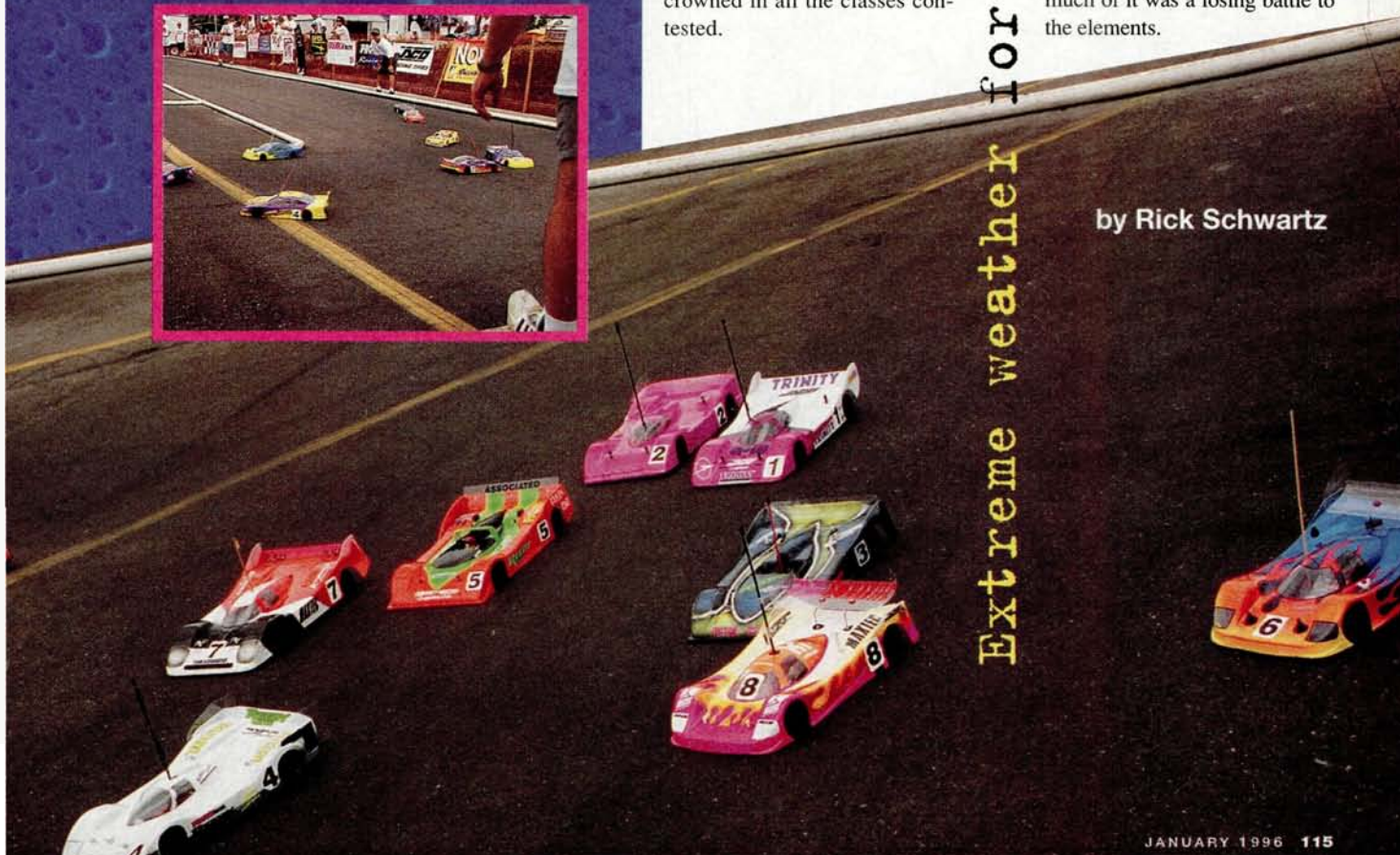
**N**APLES, FLORIDA. On the state's west coast, this is a beautiful, laid-back city; sunshine and the Gulf breezes make it idyllic. Unfortunately, in June, it's hot and it rains—a lot. The 170 racers at the '95 ROAR On-Road Nationals had to deal with heavy rain, heat and humidity. Practice was almost non-existent, and Friday's nasty weather caused the Qualifiers to be canceled. Now for the good news! The competition was hot and heavy, and new champions were crowned in all the classes contested.

## THE TRACK

The crew of the Southwest Florida R/C Raceway did their best to provide a challenging layout and spent time and money building permanent, covered pit space with electricity for this event. We all know, though, that the one thing we can't control is the weather, which almost defeated their efforts. Many racers complained about the condition of the track, but the weather was to blame for most of their problems: rain, heat and extremely high humidity make for short tempers. Track maintenance was ongoing, but much of it was a losing battle to the elements.

by Rick Schwartz

Extreme weather for extreme racing





## QUALIFYING

Adequate practice time and four Qualifiers had been scheduled, but the rain caused everything to be reshuffled. On Friday, pre-race practice and the Qualifiers had to be canceled because of the rain; three Qualifiers were run on Saturday, with the hope of running the fourth on Sunday. It wasn't to be, though. With the threat of rain on Sunday morning, the race director decided to cancel the fourth heat to ensure that the Mains would all be completed. You had your chance to make the A-Main three times on Saturday, and racers and pit crews scrambled to make the most of it.

• **1/12-scale.** Stock was first. Three proved to be the lucky number; almost all the drivers turned in their best times in the third and final round. TQ Brian Berry, who didn't make the second-round heat, ran for 33 laps in 8:11.85; second spot went to Steve LaFara with 33 laps in 8:15.16; and third went to Jacob Pritchard with 32 laps in 8:02.28.

The Mod class was topped by Tony Neisinger with 37 laps in 8:12.73; Mike Lufaso went 36 laps in 8:05.54 to grab the second spot on the starting grid; and perennial champion Joel Johnson ran 36 laps in 8:07.17.



**The Southwest Florida R/C Raceway provided a challenging track layout, an awesome drivers' stand and a covered pit area.**

• **1/10-scale.** In the Stock class, Jacob Pritchard—already in the 1/12 Stock A-Main—showed his stuff by topping the field with 16 laps in 4:07.43. Really, really close behind—just 19 seconds off the TQ pace—was Randy Rock; Pete Maiolo was third with 16 laps in 4:09.77.

The Mod class belonged to Tony Neisinger, who again turned the fastest Qualifier to take a double TQ with 19 laps in 4:10.72. Hot on his tail was Joel Johnson, just 1/2 second behind; Mike Lufaso finished third.

• **"Provisional" F1/Indy heats.** Not content to leave a national race without a TQ,

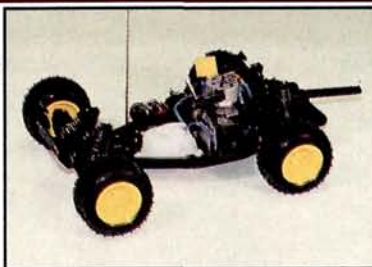
Joel Johnson blew away the competition, turning 21 laps in 5:09.40. He was the only qualifier who turned more than 19 laps, and he did it three times, with 21 laps in each heat. Second spot went to Josh Cyrul with 19 laps in 5:02.7 and third to Novak's Tyree Phillips.

## MAINS AND CONCOURS

Although Sunday dawned dark and ominous, the expected rain never materialized, and it turned out to be a beautiful day. The track was open for about two hours of controlled practice before the Mains.

*(Continued on page 118)*

## NEW NITRO STORM 21-XS TRUCK



The Nitro Storm 21-XS comes complete with a 21 P/S engine, ABC piston/liner, ball bearing crankshaft, slide carb. New strong steel chassis, full ball bearing set and fully ballraced transmission and clear molded body.

U400 NITRO 10 "STORM 21-XS" TRUCK SALE PRICE \$265.50



## NEW CAT 2000 E.C.S. THE RALLY CHAMPIONSHIP

CAT 2000 E.C.S. "SPORT"  
4WD COMPETITION ELECTRIC

The CAT E.C.S. is an economical sport version of the CAT E.C. with the same laydown suspension and shorter parallel pin wishbones. Option parts enable you to fully upgrade to the Euro Championship edition.

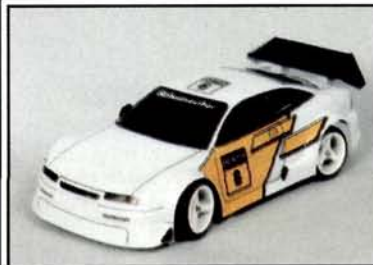
U401 NEW CAT 2000 E.C.S. "SPORT" 4WD SALE PRICE \$221.70

## NEW club10-2 First time racing



All new gear transmission and heavy duty diff. The new transmission is easy to assemble and has no adjustments to worry about while the differential uses the same components as the Nitro 10 range for greatly improved reliability. New moulded black vari-shocks with dampening snap on suspension and steering links which require no adjustments.

CLUB 10-2 - ON ROAD TOURING 2WD SALE PRICE \$107.70  
Choice of 5 body styles: Alfa, Opel Calibra, Escort Cosworth, Mercedes & Mondeo.



## BossCat

TOURING CAR  
4WD ELECTRIC

1/10th Scale 4WD includes motor and mechanical speed controller independent wishbone suspension, black WFE chassis, coil springs over oil filled shocks, twin UJ driveshafts, steel bushings.

BOSSCAT - ON ROAD TOURING 4WD SALE PRICE \$149.70  
Choice of 5 body styles: Alfa, Opel Calibra, Escort Cosworth, Mercedes & Mondeo.

## Schumacher USA

6302 Benjamin Road - Suite 404  
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# New in the Pits

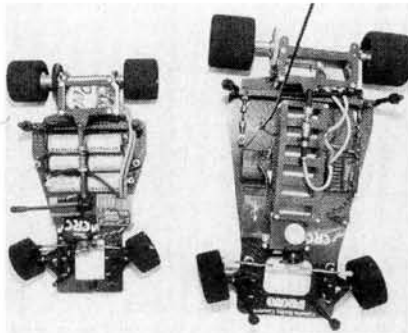
## A Real Speed Merchant

Frank Jr. of Calandra Racing Concepts introduced two new Speedmerchant Roadkill 1/10 and 1/12 on-road racers. Their chassis are made of directional graphite, which is stiffer from front to back than side to side. The 1/12-scale car doesn't have a T-bar, but instead has small side springs and a damper tube for side-to-side damping.

Front-to-back stiffness and damping are controlled by only a shock.

According to Frank Jr., this setup reduces tweaking problems and separates front-and-back and side-to-side stiffness and damping for more precise tuning. Because there isn't a T-bar, the batteries can be centered. The 1/10 racer has a three-way adjustable wheelbase and a dual-plane chassis.

■ Calandra Racing Concepts, 6860 Stanwix Ave., Rome, NY 13440; (315) 338-0867.

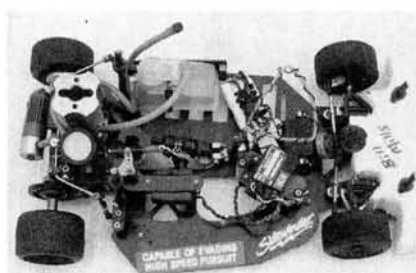


## Change is Good!!

TRC has made changing to gas as easy as 1, 2, RC10L. Tim Morton showed me his new, easy, gas conversion kit for the Associated 10L. The gas version is very similar to the electric one, and the kit includes all the parts needed to make the

changeover. Everything from the aluminum motor plate to the air cleaner is here. The kit is available with or without an engine.

TRC now produces wheels, donuts and mounted tires for Tamiya and Kyosho F1 racers. ■ TRC, P.O. Box 1058, 210 Charter St., Albemarle, NC 28001; (704) 982-0507.



## The Fantom Is Back

Batteries, motors and bearing oil. You didn't think you could get all three from Fantom Motors? Well, according to new owner, Jeff Schroeder, you can! With a unique list of modified-motor winds and their re-entry into the battery market, Fantom is striving to become one of the top suppliers of R/C racer power. As an example, their new Screamin' Demon Stock Motor will be tried, have specially treated bushings, high-performance brushes and springs, soldered-on capacitors and will be dyno'd on their Facts Machine (a performance printout will be included with each one). ■ Fantom Motors, P.O. Box 216, 209 N. Haver St., Hartford, MI 49057; (616) 621-2119.



## Nifty Niftech

A hot item for some of the F1 and on-road racers was the Niftech Ultra Precision Motor Extension Shaft—a long name for a little add-on, but it works. Hardened and ground true, with a Thermo-forged setscrew, this piece of engineering extends the motor shaft by 1/2 inch. Motor centering is made easy, especially with short-shaft motors.

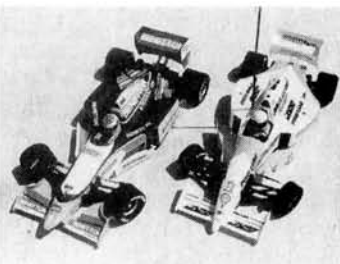
■ Niftech Precision Racing Products, 5565 Wilson Dr., Mentor, OH 44060; (216) 257-6018.

## Eppssolutely

Todd Mattson of Pro-Line/Jaco/Protoform displayed two new F1 bodies designed by Dale Epp. The Benetton Type B fits the Tamiya and HPI chassis. The McLaren Type M can be used on Tamiya, HPI and Kyosho racers. Both kits come with turning vanes, which are short vertical wings that extend from the front sides of the chassis. Both bodies look really hot!

Also new from Pro-Line/Jaco/Protoform are F1 pre-trued donuts, wheels and mounted tires for most F1 cars. Available in most compounds, the combination is lighter than the stock Tamiya setup. The 1/12 racer also gets a chance to try new products with foam tires and wheels in a variety of compounds.

■ Pro-Line/Jaco/Protoform, P.O. Box 456, Beaumont, CA 92223; (909) 849-9781.



## I Heard it through the Grape "Vines"

Known for his company's winning tires, BSR owner Ronnie Vines showed me the new light-fiberglass axle he's now producing. Made for all race-cars, it has a very high tensile strength and is centerless ground, and Ronnie guarantees the end won't break off. Tony Niesinger used it to TQ in both the 1/10- and 1/12-scale Mod classes at the On-Road Nats.

■ BSR, Rte. 6 Box 54, Killen, AL 35645; (205) 757-1564.



## Thunder Road

World and Oval Masters champion racer Mike Boylan showed me two products from his new company, Thunder Racing. For stock-motor brush and comm break-in,

they offer Launch comm drops; for mod motors, try Dragon Drops. Both products reduce

carbon build-up, prevent the brushes from glazing and reduce comm wear. According to Mike, use of these products makes comms and brushes last a long time and increases rpm.

■ Thunder Racing, 1834 Nebraska Ave., Palm Harbor, FL 34683; (813) 786-1898.



## Seeing Is Believing

The Rainbow Rider—Evan Shenfeld—hosted this year's concours and also displayed his unique line of driving glasses. An optician by profession, Evan has studied how wearing different lenses can improve racers' abilities to "track" their cars as they race. Whether it's on-road, off-road, or oval he has lenses that will make your racer "jump" out at you. I tried them; they work! ■ Rainbow Rider, 118 N.E. 1st Ave., Hallandale, FL 33009; (305) 456-7200.

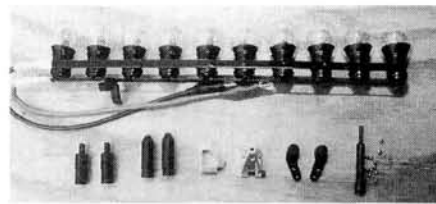


## Hey, Norton!!

Ron Norton of Raceway Mfg. showed off some of his new wares. As always, his trailer was loaded with the "little" goodies that pay off big. Included in this trip were a 20A

discharger with alligator clips; a roadcourse, adjustable, threaded body mount; a Delta shock mount for the 10L; LS-type dyed-nylon steering blocks; an adjustable shock mount for the 10L, Hyperdrive, Woods and Cobra cars; and, finally, a really neat diff ball tool that makes installation and removal a lot easier and lets you store the balls in its handle.

■ Raceway Mfg., 283 S. Janice Lane, Ormond Beach, FL 32174; (904) 677-2635.





(Continued from page 116)

• **Concours.** Sponsored by Evan Shenfeld of Rainbow Riders, this was the day's first event. The cars were beautiful, and the three winners deserved their awards:  $\frac{1}{10}$  Best of Show—Steve "Tinman" Platt for his Parma/PSE Mustang;  $\frac{1}{12}$  honors—past winner Amber Taylor used her Disney Snow White theme to capture this with an Associated Nissan. The newest category—F1/Indy—was the prize of Bobby Taylor with a '95 Protoform Benetton.



"...and she's buy...yi...innnn..." **Barry Baker** wows the crowd with his version of *Stairway to Heaven*.

The A-Mains were completed first:

•  **$\frac{1}{12}$ -scale Stock** took the starting grid first. Brian Berry held true to his TQ performance by turning consistent 14-second laps to win with 34 laps in 8:12.39. Jacob

## Why the Up-ROAR?

**M**aybe it was the rain. Maybe it was the heat. Tempers were short. Whatever the reason, it was a ROAR National Championships, and *one person had to be responsible for decisions that were related to the organization's rules. It didn't work out that way....*

The track management was at odds with the ROAR representative over some of the technical rules concerning the legality of bodies in some classes. The Naples track was chosen for this event with the support of the local ROAR officials. Why hadn't the parties resolved their differences of opinion well before the event? Racers had prepared all year and spent their money on the trip, so it wasn't fair to have rule changes at the last minute.

We heard: "Well, this is the way we do it here"—great for the local racers who regularly compete at that track, but what about drivers from elsewhere who had prepared according to the *national* ROAR rules?

Who was at fault?—probably both parties: the track for not adhering to the rulings of the region director, and ROAR for not issuing a timely, up-to-date rule book. To resolve the problem, before a national event, ROAR could issue the latest rules for a particular class and distribute them to drivers when they register. However it's done, a more organized format must be initiated if these events are to be successful.



**Novak's Tyree Phillips (center)** walked away with the **F1 Stock** win.

Pritchard stayed hot on his tail throughout the race, but he had to settle for the second spot with 34 laps in 8:14.61. Taking third by just 0.04 second—8:01.65 to 8:01.69—second-place qualifier Steve Lafara just nosed out Chris Mazzola, who had come up from 10th to take the fourth position.



**Trinity's Joel Johnson** preps his **F1** car. **Joel** went on to **TQ** the class by posting an amazing **21** laps in all three qualifiers.

## F1/Indy Let's Keep It!!



**A** new category at this year's championships was a "Provisional" F1/Indycar class—"provisional" in the sense that ROAR wanted to see whether there was enough interest to sustain such a class and whether the rules set up for it would work. The answer to both questions is a resounding *yes!*

Drivers competed in cars by Tamiya, Kyosho and HPI—a true representation of the kits on the market. Many of the manufacturers of on-road cars showed me new products or told me about hop-ups they have on the drawing board for this popular, fast-growing segment of the sport.

The aftermarket names include TRC, Pro-Line/Jaco, Protoform, Calandra Racing Concepts and Kimbrough. The racing fraternity can be sure that if manufacturers are spending time and money on developing these products, the market must be well-established. The class is new; it's innovative; and it's drawing new faces to the track.

Let's hope that ROAR continues to support the development and expansion of the F1/Indy class and makes it an official championship event at next year's Nationals. It gives everyone the opportunity to compete. It also gives everyone the opportunity to win at the national level. Congratulations to class winner Tyree Phillips!

•  **$\frac{1}{12}$ -scale Mod.** This was *fast!* TQ Tony Neisinger led for a while, but he eventually relinquished his lead to winner Joel Johnson, who turned 37 laps in 8:10.90—better than the TQ time. Floridian Paul Wynn charged to the third spot with 36 laps in 8:02.25. Just watching Johnson and Neisinger duel for the win was a real pleasure.

•  **$\frac{1}{10}$ -scale Stock.** Randy Rock moved from being second qualifier to take the title



## F1 STOCK

Fin	Qual	Name	Chassis	Motor	Battery	ESC	Radio	Body	Tires
1	3	Tyree Phillips	Tamiya	Handout	Orion	Novak	KO	Tamiya	TRC
2	4	Bob Hall	Tamiya	Handout	Per.Match	Tekin	Futaba	Protoform	PSE
3	5	Joe Conte	HPI	Handout	Per.Match	Tekin	Futaba	Protoform	PSE
4	9	Marc Pritchard	Kyosho	Handout	Trinity	Tekin	Futaba	HPI	Jaco
5	6	Jay Kimbrough	Tamiya	Handout	Ballistic	Novak	Futaba	Tamiya	Jaco
6	8	Scott Schilke	HPI	Handout	Team Smth.	Tekin	Airtronics	HPI-Mclaren	PSE
7	7	Bill Fraden	Tamiya	Handout	SCR	Tekin	KO	Ferrari	TRC
8	10	Ritch Grubb	HPI	Handout	Team Smth.	Tekin	Futaba	Mclaren	TRC
9	2	Joshua Cyrul	Kyosho	Handout	Stage III	Novak	JR Propo	Protoform	TRC
10	1	Joel Johnson	Kyosho	Handout	Trinity	Novak	Airtronics	Kyosho	Jaco

## 1/10 STOCK

Fin	Qual	Name	Chassis	Motor	Battery	ESC	Radio	Body	Tires
1	2	Randy Rock	Associated	Handout	Max-Cell	Tekin	Airtronics	PSE	Jaco
2	6	Mike Spehn	Associated	Handout	Per. Match	Novak	Airtronics	PSE	PSE
3	3	Peter Maiolo	Speed Mcht.	Handout	Per. Match	Novak	Futaba	PSE	Jaco
4	1	Jacob Pritchard	CRL	Handout	Trinity	Tekin	Futaba	PSE	Jaco
5	4	Steve LaFara	Wood Racing	Handout	Per. Match	Tekin	JR-756	Parma/PSE	TRC
6	7	Tom Esposito	Trinity	Handout	Trinity	Novak	JR-756	PSE	Jaco
7	8	Walter Henderson	Associated	Handout	Stage III	Tekin	Airtronics	PSE	Associated
8	10	Mike Travis	Associated	Handout	Trinity	Novak	Airtronics	—	—
9	9	Nick Tomlinson	Composite	Handout	Reedy	Novak	Futaba	PSE	TRC
10	5	Tony Padilla	Associated	Handout	G.R.P.	Novak	Airtronics	PSE	Jaco

## 1/10 MOD

Fin	Qual	Name	Chassis	Motor	Battery	ESC	Radio	Body	Tires
1	3	Mike Lufaso	Associated	Reedy	Orion	Novak	Airtronics	Associated	Jaco
2	1	Tony Neisinger	Associated	Maxtec	Ballistic	Tekin	Airtronics	Andy's	BSR
3	9	Paul Wynn	Associated	Reedy	Reedy	Tekin	Airtronics	PSE	Jaco
4	8	Dave Vera	Associated	Reedy	Per. Match	Tekin	Airtronics	PSE	Jaco
5	5	Mark Matuszek	N/A	Maxtec	Stealth	Novak	Airtronics	PSE	Jaco
6	4	Dave Reiman	Associated	Reedy	World Cla.	Novak	KO EX-1	Protoform	Jaco
7	10	Bobbe Ochoa	Associated	10 Quint	Orion	Novak	Ko Propo	Andy's	Jaco
8	2	Joel Johnson	Trinity	Trinity	Trinity	Novak	Airtronics	Andy's	Jaco
9	6	Barry Baker	Yokomo	Maxtec	Stealth	Novak	Airtronics	Protoform	Jaco
10	7	Frank Calandra	Calandra Rc.	Peak Per.	Orion	Novak	JR Propo	Protoform	Jaco

## 1/12 STOCK

Fin	Qual	Name	Chassis	Motor	Battery	ESC	Radio	Body	Tires
1	1	Brian Berry	Associated	Handout	Powerpush	Novak	Ko Propo	Protoform	Yokomo
2	3	Jacob Pritchard	CRC/Speed	Handout	Trinity	Tekin	Futaba	Protoform	Jaco
3	2	Steve LaFara	Wood Racing	Handout	Per.Match	Tekin	JR-756	Protoform	TRC
4	10	Chris Mazzola	Associated	Handout	Team Big 1	Novak	JR-756	Protoform	BSR
5	6	Lance Elbertson	The secret	Handout	Sanyo	Tekin	Futaba	Toyota	Pink
6	7	Dave Berry	Associated	Handout	Powerpush	Novak	KO	Protoform	Yokomo
7	5	Mike Spehn	Associated	Handout	Per.Match	Novak	Airtronics	PSE	PSE
8	8	Tony Padilla	Associated	Handout	GRP	Novak	Airtronics	Protoform	TRC
9	9	Walter Henderson	Associated	Handout	Stage III	Tekin	Airtronics	PSE	TRC
10	4	Scott Williams	Calandra	Handout	PSE	Novak	KO	PSE	PSE

## 1/12 MOD

Fin	Qual	Name	Chassis	Motor	Battery	ESC	Radio	Body	Tires
1	3	Joel Johnson	Trinity	Trinity	Trinity	Helbing	Airtronics	Andy's	Jaco
2	1	Tony Neisinger	Associated	Maxtec	Ballistic	Tekin	Airtronics	Protoform	BSR
3	6	Paul Wynn	Associated	Reedy	Reedy	Tekin	Airtronics	Associated	Jaco
4	2	Mike Lufaso	Associated	Reedy	Orion	Novak	Airtronics	Associated	Jaco
5	5	Mike Blackstock	Wood Racing	Fantom	Team Orion	Tekin	JR	Protoform	BSR
6	4	Dave Reiman	Associated	Reedy	World Cl.	Novak	KO	Protoform	Jaco
7	8	Chris Mockerman	CRC	Peak	Orion	Novak	JR-756	Protoform	Jaco
8	7	Joshua Cyrul	Associated	12x2	Reedy	Novak	JR	Protoform	TRC
9	10	Barry Baker	CRC	Maxtec	CRC	Novak	Airtronics	Protoform	Jaco
10	9	Jon Orr	Associated	14 Quint	Orion	Novak	KO	Protoform	Jaco

with 17 laps in 4:07.90. Orlando-based Mike Spehn, who's well-known in local racing circles, took second; Pete Maiolo was third.

• **1/10-scale Mod.** This was a shocker. Third-place qualifier Joel Johnson shot into the lead by turning sub-13 second laps. It looked as if it would be a double championship for Johnson, but on the fourth lap, his car died because of a blown speed control. Taking advantage of the situation, Mike Lufaso and TQ Tony Neisinger

duelled for the lead; Lufaso eventually took the checkered flag with 19 laps in 4:09.25; Neisinger placed second with 19 laps in 4:12.05; and Paul Wynn took home his second, third-place trophy in the Mod division.

• **F1/Indy.** The field was narrowed when TQ Joel Johnson failed to make it to the starting line. It was anyone's race. Tyree Phillips flawlessly drove his Tamiya F-103 to victory lane. He spends most of his time in the pits representing Novak Electronics, so it was good to see Tyree in the winners'

circle. Second spot in this inaugural event went to Bob Hall and third to Joe Conti.

## FINAL THOUGHTS

New faces, new classes and new champions! It's always a pleasure to see the looks on the faces of the trophy winners, especially if it's their first time in the winners' circle. The race had some problems, but overall, it fulfilled its responsibility—producing the 1995 ROAR On-Road Champions. ■







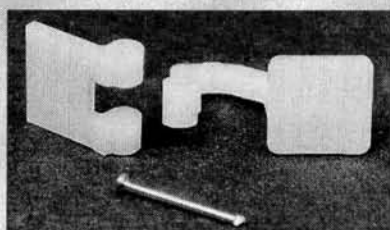
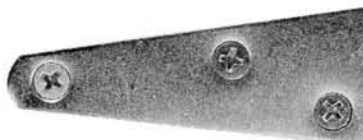
# HOW TO

by Kevin Hetmanski

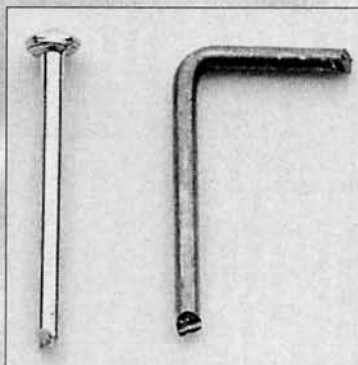
# Make Opening Doors



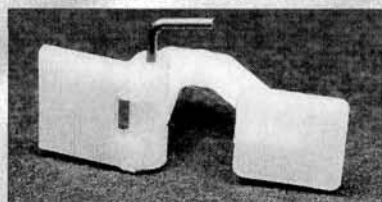
*Adding hinges and realism to your ABS plastic body*



A hinge from which the original center pin has been removed.



The custom, L-shaped, brass-rod hinge pin (top) should be cut  $\frac{3}{16}$ -inch longer than the original hinge pin (bottom) and bent at the  $\frac{3}{16}$ -inch mark as shown.



When it's inserted into the hinges, the L-shaped pins allow the door to be removed easily.

ONE OF the great things about the hard-plastic, ABS bodies used on monster trucks such as Tamiya's\* Clod Buster and Bullhead is that you can make them as detailed as any static model. Super-scale engines (such as those by Parma\*), custom lighting and airbrushed paint jobs that could win at any full-size car show are commonplace among the monster-truck set.

One more way to add realism and detail to your car or truck's ABS plastic body is to add doors, hatches and hoods that actually open. It isn't as difficult as it may sound.

You'll need:

- two bodies—one in good condition (for the vehicle) and one to "donate" its doors;
- a steady hand;
- some basic tools;
- thin brass rod;
- the desire to make your vehicle stand out from all the others.

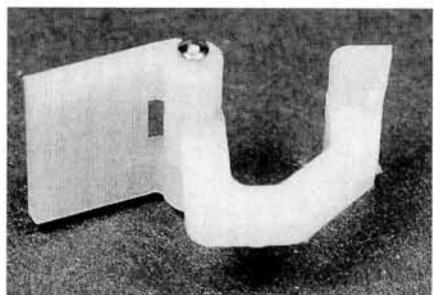
ABS bodies are expensive, and you need two for this, so ask friends and hobby shops if they have any that they don't want. Only one body has to be in good condition;

the other one could be damaged, as long as the parts you need—doors, hood, etc.—are in good shape. Even if the doors have some

minor scratches, don't worry about it. We can fix that later.

## OPEN SEZ ME!

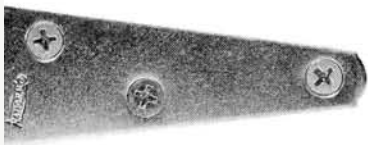
Using a Dremel\* cut-off wheel, cut the door openings out of the good body; cut



Small, nylon, Sonic Tronics hinges look most realistic in this application.

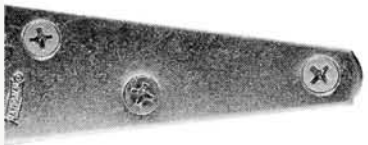
When you're sanding, be careful and take your time; it is much easier to take plastic off than to add plastic.





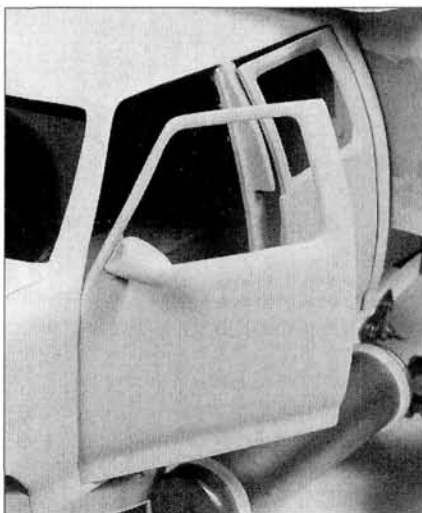
along the *inside* of the molded door line. Then, on the bad body, cut along the *outside* of the molded door line. When you cut, go as close to the line as you can, but *don't* go over it.

Next, sand the edges of the doors and the door openings until they're smooth and straight. Test-fit the doors often to see whether they fit the openings tightly. If the doors don't fit well, sand the areas around them until they do fit. When you're sanding, be careful and take your time; it is much easier to take plastic off than to add plastic. When the doors fit snugly, you can add the hinges.



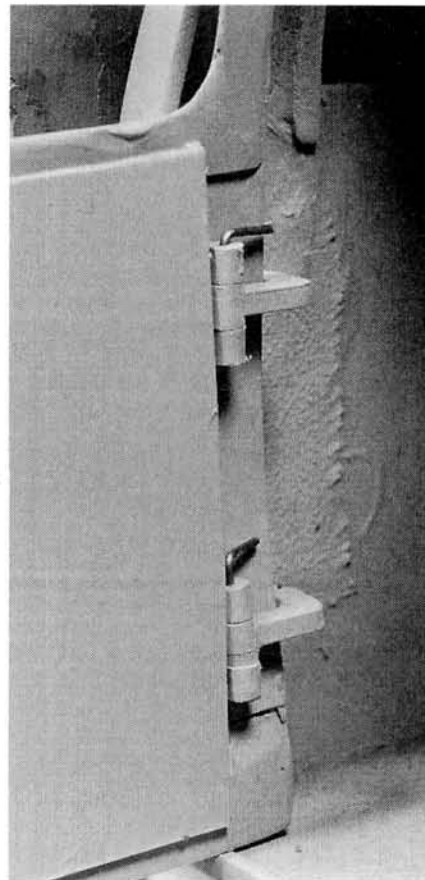
### ADD HINGES

The simplest type of hinge is the brass butt hinge, but almost any small hinge will do. I chose the small, nylon Sonic Tronics\* hinges that look very realistic because they can be installed in such a way that they don't show.



You'll need two hinges for each door. To make each hinge:

- Remove the pin from the center of the hinge.
- Take a piece of brass rod that has the same diameter as the pin, and cut a piece that's about  $\frac{3}{16}$  inch longer than the original pin.
- At the  $\frac{3}{16}$ -inch mark, bend the new rod at a 90-degree angle.
- Put the new, L-shaped, brass-rod pin into the hinge. The extra bent piece of pin will allow you to pull out the pin and remove the doors easily whenever you want to.
- Hold the door in place in the opening using a piece of tape, then use a small drop of glue to tack the hinge to the door and the body.
- From the outside of the body, drill a hole though both the body and the hinge. Countersink the hole so that the screw head will fit flush against the body. Put the



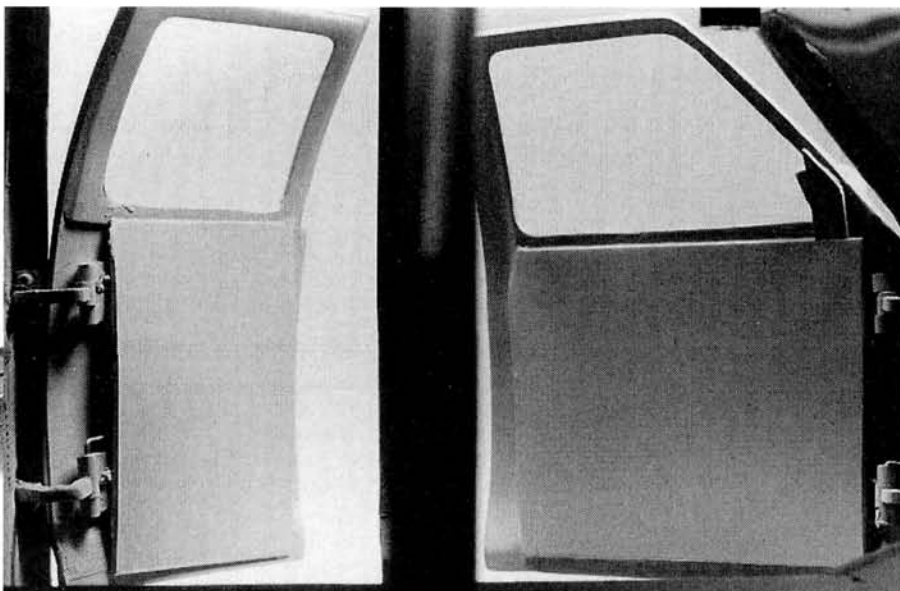
**The result of all that hard work—scale realism par excellence.**

screw loosely into the hinge.

- When the glue has dried, take the tape off the door and check to see whether it swings freely. If it doesn't, remove the hinges re-tack them into position with a little glue, and adjust them until the door swings properly.
- With the screws loosely in place, check the fit of the hinges. Because the doors are curved and the hinges are flat, you might have to insert shims between them. Remove the door, put in a shim, then re-attach the door to see how it fits.
- When you're happy with the way the door swings, fully tighten the small, flat-head screws. Then cover the countersunk screw heads with filler, sand the filler smooth, and sand out any scratches there might be in the doors.
- The body is now ready for paint.

Now that you know how to make doors that open, you can do almost anything. The next thing you know, you'll be making hood tilts, opening tailgates, or even bed tilts.

\*Addresses are listed alphabetically in the Index of Manufacturers on page 264.



**A view of the hinged doors from the interior. Door panels add to the truck's scale realism.**

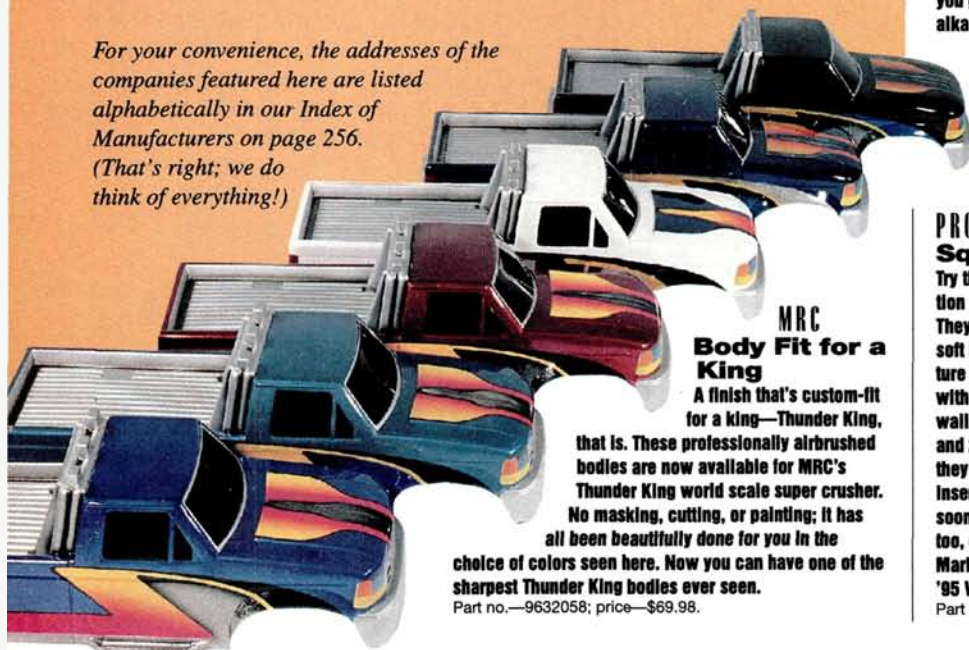


# NEW for '96

by John Howell, Chris Chianelli and George M. Gonzalez

**L**ET'S START the new year right! No, we don't think you should take up flower arranging (do you have to copy everything Chris does?). If you run outdoors, there's not much to do at this time of year except get ready to roll in the new season. That's why we always give you this annual roundup of go-fast goodies, drop-dead doodads, high-tech hop-ups...; you get the idea. We sent spies all over; here's what they saw.

*For your convenience, the addresses of the companies featured here are listed alphabetically in our Index of Manufacturers on page 256. (That's right; we do think of everything!)*



## MRC Body Fit for a King

A finish that's custom-fit for a king—Thunder King, that is. These professionally airbrushed bodies are now available for MRC's Thunder King world scale super crusher. No masking, cutting, or painting; it has all been beautifully done for you in the choice of colors seen here. Now you can have one of the sharpest Thunder King bodies ever seen.  
Part no.—9632058; price—\$69.98.

## TEAM LOSI

### Budget XX and XX-T

These entry-level Double-X and Double-XT trucks and buggies are almost identical to their national-title-winning siblings, but they lack a few of the high-end items found on the full-blown racers (upgrade them as your budget allows and your skills improve). The kits come with anodized-aluminum shocks, bushings (a bearing is used on the tranny's output shaft), and a friction slipper, minus the Hydra Drive.

Both kits come in a version that has a mechanical speed control, and a stock motor is included.

Part nos. and prices: A-0040—Double-X with motor and speed control, \$229.95; A-0041—Double-X without electrics, \$209.95; A-0080—Double-XT with motor and speed control, \$239.95; A-0081—Double-XT without electrics, \$219.95.



## TRINITY

### Rechargeable Battery for Airtronics Caliber Transmitter

Tired of hearing that incessant low-battery beeping sound from your Airtronics radio? If you are, check this out. It's a 9-cell rechargeable pack for Airtronics Caliber radios. Currently available rechargeable packs for this radio only have eight Ni-Cd cells (9.6 volts), but the radio was designed to run on eight alkaline batteries (12 volts). This is simply too much of a voltage difference, and battery life between charges is very short. With the Trinity Airtronics transmitter pack, you get 10.8 volts—a lot closer to what's available when you use alkalines. The pack will last longer between charges and you will have fewer range problems and less glitching caused by a transmitter-pack voltage that's too low.

Part no.—RC555; price—\$55.99.



## PRO-LINE Square Fuzzies

Try these tires for maximum traction on slick, hard-packed dirt. They're made of Pro-Line's super-soft M2 compound, and they feature a low-profile, flat carcass with reinforced interior and sidewall. They'll fit any 2.15-, 2.175- and 2.2-inch rear wheels, and they come with a set of foam inserts. These hot new rears will soon be available in a version that's suitable for racing trucks. You, too, can own the same tires as Team Associated's Matt Francis and Mark Pavidis used to dominate the 2WD and 4WD classes at the '95 Worlds.

Part no.—8089M2; price—\$12.50.







**TRINITY PRODUCTS**  
**Midnight Reverse Rotation Motor**  
 This is technically identical to Trinity's all-new Midnight stock motor; it's just designed for reverse rotation. The Midnight Reverse Rotation is ideal for left-side-drive superspeedway cars, and it can complement the standard-rotation Midnight in dual-motor monster-truck applications.

Part no.—RC2096; price—\$39.99.



### Monster Stock Jr. 3 Motor

The Monster Stock Jr. 3 has all the same technological advancements as the Midnight, but it features 30 degrees of timing instead of 24 degrees. Why? This pink Monster was designed with NORCCA rules in mind.

Part no.—RC2097; price—\$39.99.



### Speedgems Jade

Also new in the Speedgems lineup is the Jade—a machine-wound modified motor. It's a 15-turn quad that's great for racing trucks and 2WD buggies. The Jade features 5.1 magnets, a 1.2mm-thick can, dual ball bearings and adjustable timing. At 6 volts, the Jade kicks out 27,000rpm.

Part no.—9207; price—\$49.99.



### Speedgems Quartz

New to Trinity's Speedgem lineup is this Quartz, 19-turn, double modified, machine-wound motor. Ideal for parking-lot racers such as sedans and F1 cars, the Quartz features 5.1 magnets, a 1.2mm-thick can, dual ball bearings and adjustable timing. At 6 volts, the Quartz kicks out 21,500rpm.

Part no.—9206; price—\$49.99.



### LUNSFORD New Titanium Products

At last, here's a titanium hinge-pin kit for Tamiya TA02 sedans (part no. SD-600). The new pins are much lighter than the original hardware, and they're almost impossible to bend. The short, "Fat Boy" titanium motor screws are easy to handle, because—predictably!—they're fatter than most screws, and the washers (part no. F-900) have a neat recess for the screws and a larger surface area than conventional washers.

Part nos. and prices—SD-600, \$16; F-900, \$5.95



### THUNDER TIGER "True" ABC Replacement .12-Cylinder Sleeves and Pistons

New for the O.S. CZ-R and CZ-Z engines, these sleeves are of true ABC construction, not just nickel-plated. The combo will allow O.S. owners to upgrade their engines to ABC technology at a lower price than the original (nickel) units. What are the benefits of ABC technology? Simple: your engine will last longer.

Part nos. and prices—N0546 (for Thunder Tiger Pro-12B and O.S. CZ-R), \$39.99; AN0547 (for Thunder Tiger Pro-12BZ and O.S. CZ-Z), \$49.99.

### NOVAK Tempest Pro ESC

This ESC's revolutionary circuitry provides smoother throttle response, quicker acceleration, longer run times, an increased radio range and a cooler operating temperature than conventional controls. In fact, Novak says that the Tempest Pro has the coolest operating temperature in the industry and that heat sinks aren't even necessary. It offers six HYPERFET II drive transistors, Super-Flex 12-gauge wire, a high current rating of 420 amps and a 210A brake circuit (almost twice that of any other racing speed control). Other carry-over features are Novak's One-Touch Set-Up™, the CLC II current limiter, and Novak's heavy-duty BEC (6 volts, 5 amps).

Price—\$199 to \$219 (estimate).



### PROTOFORM Nevada XX-T

Based on the 1996 Chevy S-10, the all-new, authentic-looking Nevada XX-T body was designed to fit the Losi XX-T off-road race truck. It fits like a glove, is made of 0.040-inch-thick Lexan, and it comes with a molded add-on spoiler and integral dirt deflectors to keep the dirt off the shocks and the chassis.

Part no.—1510; price—\$19.95.

### 1996 T-Bird HS

Exhaustive wind-tunnel testing led up to the production of this "HS" (high speed) T-Bird body—the ultimate for all who race on high-banked, high-speed ovals and velodromes (where high downforce is required). Within 24 hours of being produced, the first few bodies shattered the track record at the Indy velodrome, took the top five qualifying positions, and finished in the top four places. Event winner Mike Blackstock set a new track record with an unheard of 20 laps; and he did it three times. This sleek new body is available in "light-" and "regular-" weight versions, and it comes with an add-on rear spoiler.

Part no.—1210L HS, or 1210R HS; price—\$19.95.



### RAMbunctious ET

The "ET" (electric truck) version of Protoform's popular Dodge Ram truck body was designed to fit the RC10T2 as well as the earlier RC10T. This durable 0.040-inch-thick Lexan body features the latest in truck styling; it's compact, yet it still looks like the real "Walker Evans" race trucks. Its molded-in dirt deflectors keep dirt off the shocks and chassis, and a molded add-on rear spoiler enhances downforce.

Part no.—1509; price—\$19.95.



### TRAXXAS Spirit Truck

Traxxas says that this new truck is the least expensive, ready-to-run, hobby-class truck on the market. The Spirit features: a plastic chassis; real rubber semi-pneumatic street slicks; a hot, 20-turn motor; a street-rod-style body; and four, adjustable, coil-over, oil-filled shocks; and it comes with a pistol-grip radio.

Part no. 1209 (fully assembled with radio system).



# NEW for '96

## OFNA RACING Anodized-Aluminum Hardware

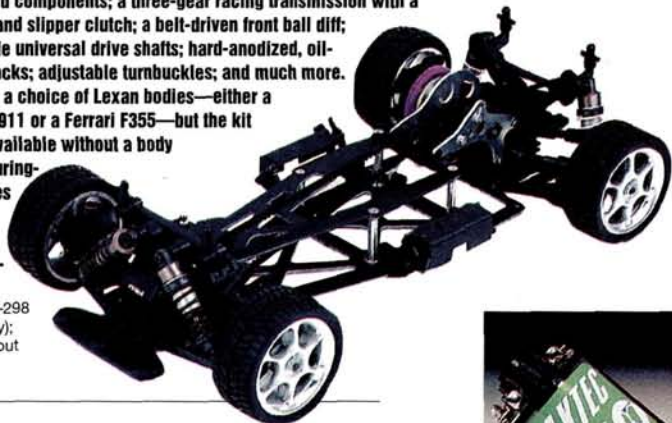
OFNA Racing's complete line of anodized-aluminum hardware hop-ups in an assortment of colors includes: 3mm and 4mm ball joints, locknuts, concave washers and cone washers; locking collars; and 45-degree, silicone, air-filter tubes in a variety of colors. These colorful parts will dress up your R/C car and make it more durable. Call for prices.



## HOBBY PRODUCTS INTERNATIONAL (HPI) RS4 Touring Car

The 4WD RS4 touring car features a lightweight, double-deck, black-fiberglass chassis; 4W independent suspension with fiber-reinforced components; a three-gear racing transmission with a ball diff and slipper clutch; a belt-driven front ball diff; adjustable universal drive shafts; hard-anodized, oil-filled shocks; adjustable turnbuckles; and much more. You have a choice of Lexan bodies—either a Porsche 911 or a Ferrari F355—but the kit is also available without a body (most touring-car bodies will fit without modifications).

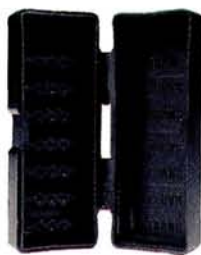
Part no.—298  
(with body);  
288 (without  
body).



## RPM Crystal Case

Store up to four pairs of radio crystals safely and neatly in this compact, rugged, injection-molded case. The crystals fit into small holes in the case bottom, keeping their pins straight, clean and protected. The clearly marked case sides allow you to keep your transmitter and receiver crystals separate.

Part no.—8039; price—\$7.95.



## TEKIN ELECTRONICS BC110L Charger

Weighing in at 1 pound and measuring 3x4x2 inches, Tekin's new charger has a ton of features: adjustable output current (0.5 to 10 amps); high-performance linear current output; fully automatic peak-detection

operation; light, compact construction; precision components; calibrated dial (for accurately adjusting the current); external volt-meter/ammeter jacks; new 33Khz digital switching circuitry (for cool, safe operation and high performance); and easy, one-button operation. It also works with a variety of power supplies.

Part no.—3000; price—\$110.



## TRINITY Buggy Grip

Use Buggy Grip tire-traction spray to soften, make stickier and condition off-road tires such as those made by Team Losi and Pro-Line. Spray any part of the tire—sidewalls, spikes, etc.—and let it air dry. The more you put on, the softer the tire becomes.

Part no.—RC6052; price—\$6.99.

## OFNA RACING O.S. CZ-R and CZ-Z Boost Bottles

This hot new add-on helps the CZ engines accelerate from idle to top speed. According to Dave Morales of OFNA, the bottle's chamber neutralizes the pressure difference between high and low ends below the carburetor. Boost Bottles come in two versions: one includes a finned heat sink and is to be attached to the engine's backplate; the other was designed to be mounted wherever space permits.

Part nos. and prices—32880 (rear cover), \$29.95; 32870 (add-on), \$19.95.



## MAXTEC DEVELOPMENT Tuned 24-Degree Stock Motor

Every one of these motors has been individually tuned to suit competitive F1 or touring cars. They feature capacitors, specially tuned spring tension and chemically treated V-slot silver racing brushes, and every motor is packaged in a protective case that also contains its TURBOdyno results.

Price—\$40.



## SCHUMACHER USA Cat 2000 E.C.S.

Here's a new sport version of the '95 European Championship-winning car, the Cat 2000 E.C. The rolling chassis includes: a belt-driven 4WD drive train with ball diffs and a one-way front drive; laydown suspension with oil-filled, coil-over shocks; competition racing tires; and a low-profile body shell with adjustable wing and undertray. Schumacher says the car may be fully upgraded to full E.C. specifications and beyond, so you can upgrade it as your driving skills improve. To convert from "buggy" to "touring car," there's an optional body-mount kit.

Price—TBA.

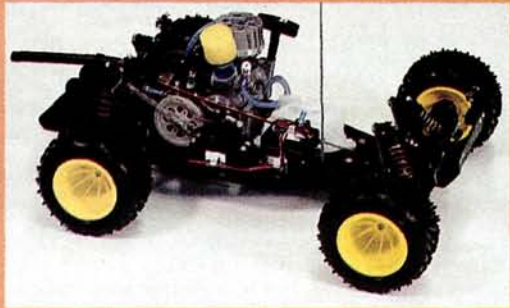


## Nitro 21-XS

The 1/10-scale 21-XS nitro-powered stadium truck has a big-block .21 bolted into the chassis (no, this is not a misprint!). The truck features: a super-strong steel chassis; independent suspension with oil-filled, coil-over shocks; full ball bearings; a stylish Storm racing truck body; and a nitro 21-XS pull-start engine with ABS construction, ball-bearing supported crankshaft and a high-performance slide carb.

Schumacher says the 21-XS can reach speeds of more than 40mph, and it's extremely reliable.

Price—TBA.







## MAXTEC DEVELOPMENT

### Maxtec Power Drops

These Power Drops are an effective way to increase your motor's power and life; they feature the latest in high-speed lubricants and molecularly bonded protection additives. In addition, Power Drops decrease motor heat and eliminate brush glaze.

Part no.—MX-101; price—\$10.95.

## BUD'S RACING PRODUCTS (BRP)

### Super Outlaw Ovals

These are like the original 1/18-scale Outlaw Ovals, but they have a fully independent front suspension and trailing-bar rear suspension. Using R/C electronics of regular size, they operate on four, five, or six AA batteries. BRP also offers a ball diff, 6- or 7-cell assembled battery packs, and foam tires in various compounds.

Part nos. and prices—120 (truck), \$69.95; 121 (stock car), \$69.95.



## Pro-Swinger Tire Truer

Racecars with independent rear suspension systems often work best with cone-shaped tires that have usually

been obtained by running stock foams for many laps of break-in. This truer offers a new angle on tire preparation. The swinging bed is calibrated, so you can set the angle, and it's available in 120V and 240V AC versions.

Part no.—10-001; price—\$440.

## MAXMOD Deluxe 12V DC Tire Truer

The popular Deluxe Truer is now available in a 12V version for use where there's no AC power. Use a variety of power sources, including auto batteries and Ni-Cds.

Part no.—10-018; price—\$350.

## MAXMOD Dragonskin Head

Tires with a hardness of 40 shore or more are extremely difficult to turn down with abrasive cutters. Suitable for all Maxmod tire truers, using very little power, this blade cutter will neatly remove any amount of rubber.

Part no.—30-001; price—\$15.



## MAXTEC DEVELOPMENT

### Team Addition Stock Motors

Maxtec's Team Edition Stock Motors have set track records in all forms of rac-

ing—on-road, off-road, dirt and paved oval. Every motor meets Maxtec's high standards of quality. Sold in a protective plastic case with their TURBODyno results, their features include: chemically treated V-slot silver racing brushes, tuned spring tension and capacitors.

Part nos.—ms-011 and mm-092; price—\$40.



## ASSOCIATED ELECTRICS Car Carrier Bags

Team Associated have finally released the Car Carrier Bags their team drivers have been using for years. Made of tough, black nylon, they have durable brass zippers, heavy-duty handles and white silk-screened Associated/Reedy logos, and they're designed to house three double-wall corrugated-cardboard boxes, which the company sells separately.

Part nos. and prices: SP-415 (car carrier bag), \$39.95; SP-100 (car carrier boxes), \$15.



## TAMIYA AMERICA

### Limited-Edition Racing Special

For a limited time, R/C'ers can own the competition-proven 4WD TA02 chassis complete with a full array of high-performance enhancements.

Bought individually, these components would cost considerably more than the price of a kit. Hop-ups include: GT-R Universal Shaft Set and Speed-Tuned Gear Set from Skyline; a short, hard, prop shaft that was designed for the TA02; a 4WD stainless-steel suspension shaft and On-Road Tuned Spring Set. There are also upgraded tires and inserts—and much, much more. This option-packed chassis doesn't come with a body, motor, or speed control; you choose your favorite combinations to go with this souped-up chassis.

Part no.—58157; price—\$320.



## THORP RC10GT Gears

Check out these 64-pitch RC10GT replacement gears. The diff gear is machined out of hard-anodized aluminum, the idler gear is machined Delrin, and the top shaft and gear are machined steel. Also new from Thorp is this 48-pitch direct replacement for the stock idle gear.

Part nos. and prices: 4785—64-pitch gear, \$40; 4786—48-pitch idler gear, \$10.



## TEAM LOSI Five-Spoke Wheels

Looking to style-out your Double-X buggy? Check out these trick 5-spoke front and rear wheels. The 2.2 rears and 2.1 front wheels come in "Natural" (white) and bright "Losi Yellow."

Part nos. and prices—fronts, A-7040 (Natural), A-7041 (Losi Yellow), \$6; rears, A-7140 (Natural), A-7141 (Losi Yellow), \$6.

## Ford F-150

Tamiya's newest 4WD off-road race truck is an exact 1/10-scale reproduction of the tough, competition Ford F-150—winner of the grueling SCORE Desert Series. The Rough Riders Off-Road Race Team's F-150 is accurate right down to the molded spare tire and skid-plate bumper.

Its special front bumper protects it when the going gets rough. Like the Chevy S-10 and the Toyota Prerunner, the F-150 is based on a modified 4WD TA02 chassis. It features a rugged steel drive shaft, independent front and rear double-wishbone suspension and oil-filled coil-over shocks.

Part no.—58161; price—\$236.



## Dirt Thrasher

Tamiya's new 4WD off-road buggy is based on the chassis of the legendary Manta Ray. According to Tamiya, this all-out competitor is competitively priced, and it's loaded with high-performance parts, too. It boasts front and rear sealed gearboxes with bevel-gear diffs, 4W independent suspension, and large-capacity oil-filled shocks.

Also included is a 540-type motor and a forward/reverse, 3-step speed control.

Part no.—58160; price—\$198.



## VW Golf VR6

The VW Golf was introduced in 1975; 20 years and 16 million cars later, it's still going strong. Tamiya's R/C version uses the FWD chassis that's also found in the limited-release Renault Clio Williams. Its rear toe-in makes it especially easy for beginners to drive. The kit is a highly detailed

replica of the standard four-door version; it features silver-plastic mesh wheels, radial tires, separately molded mirrors and a sticker sheet that includes the headlights and VW emblem.

Part no.—58162; price—\$276.





**NEW**  
for  
**'96**



### TRINITY Aluminum Servo Mounts

These new, adjustable, purple-anodized aluminum-angle servo mounts fit all popular 1/2- and 1/4-scale on-road pan cars and allow you to adjust the servo up and down to correct bump-steer.

Part no.—RC6053; price—\$10.99.



### TRAXXAS Bandit Racing Buggy

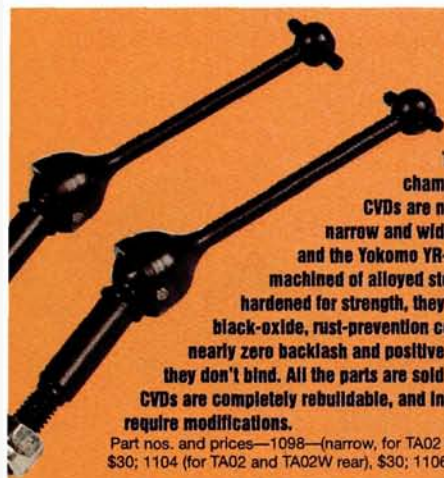
This full-blown, high-performance racing buggy incorporates all of the latest in Traxxas design and plastics technology. Traxxas says its performance can be compared with those of the most expensive competition racecars, but its price is closer to those of the least expensive. Features include: a double-deck, reinforced fiber/composite chassis; extra-long suspension arms; competition-proven bellcrank steering system; high-volume, oil-filled shocks; and a three-gear tranny with 48-pitch gears (with interchangeable spur and pinion gears).

Part nos. and prices—2401 (with motor and speed control), \$150; 2410 (ready to run with radio), \$260.

### PRO-LINE Rally Hawgs

Designed to provide serious grip on all kinds of terrain, Rally Hawgs are made out of Pro-Line's long-lasting XTR compound, and they feature a directional tread pattern with aggressive square studs that will hook up on dirt, grass, sand and pavement—all the stuff you'll find around your neighborhood. Use them to transform your off-road car into an enduro racer that will bite where other tires fail.

Part nos. and prices—8061 (rear), \$12.50; 8155 (front), \$10.50.



### MIP TA02 and YR-4 CVDs

These two-time world-championship-winning CVDs are now available for the narrow and wide Tamiya TA02 sedans and the Yokomo YR-4. Precision-machined of alloyed steel that has been hardened for strength, they're finished with a black-oxide, rust-prevention coating. They also offer nearly zero backlash and positive acceleration, and they don't bind. All the parts are sold separately, so MIP CVDs are completely rebuildable, and installation doesn't require modifications.

Part nos. and prices—1098—(narrow, for TA02 front), \$32; 1101 (wide), \$30; 1104 (for TA02 and TA02W rear), \$30; 1106 (for YR-4), \$35.

### RC10T2 Zero Maintenance Steering Kit

Here's an ultra-trick steering kit for Associated's RC10T2. Racers can use it to eliminate side play and bump steer; it's a direct stock replacement. Its light, strong, smooth, super-rigid, plastic bellcranks last longer than any others on the market. Made of glass-filled nylon, they come with machined-aluminum steering posts and Teflon®-sealed ball bearings.

Part no.—1080; price—\$29.95.



### TEKIN ELECTRONICS G-12C ESC

This has all the great features of the G-12, but it also has CoolSwitch™ Circuitry, which gives it higher power-handling capabilities and cooler operating temperatures (heat sinks are not required). Other features include special filters that shield the unit from

radio glitches, a higher operating frequency that gives 15 to 30 seconds more run time, and shunted MosFETs that ensure super-low resistance.

Price—\$199.99.



### BOLINK All Star Sprinter

This is sure to be a hit with sprint-car racing fans. Based on the economically priced Bolink Legends, this kit has many of the same features, including: a vertical-ladder chassis; independent front suspension; a ball diff with 48-pitch gears; a new servo mount for improved geometry; a one-piece body with molded-in roll cage; separate side nerf bars; adjustable front and rear wings; molded-in driver figure and exhaust headers; and an All Star Sprint Car decal sheet.

Price—\$109.95.



### DAHM'S Rammer Body

New from Dahm's, this wicked-looking stadium truck body fits the Associated RC10T2, and Dahm's says it was designed to be the lightest, lowest most aerodynamic body for the T2. Formed of 0.030-inch-thick G.E. Lexan, it includes a molded-in sunroof/escape hatch, roll bars, number plates and large rear cooling vents.

Part no.—D203; price—\$19.98.

### Phantasy Coupe Body

This beautiful, late-'30s, California custom-coupe body will fit: most narrow superspeedway cars; wide touring cars; monster trucks; Parma's Hemi Coupe and Hemi Vette; and most F1 cars. Formed of light, strong, 0.030-inch-thick G.E. Lexan, the body has fine detailing, smooth, flowing lines and a chopped top. Set it up as a high-speed oval racecar, a drag coupe, a monster coupe, or a beautiful classic custom street rod.

Part no.—D204; price—\$19.98.



## EXTREME MOTORSPORTS

### F1 and Touring Car Motors

Extreme MotorSports now offers modified and stock motors for the popular F1 and touring-car classes.

The line features Standard and Team Editions of both motors. The Team motors come prepared for aggressive racing; they feature Extreme's exclusive



race-compound brush and capacitors, they have been chemically broken in, and they have been tuned using special techniques. Every motor is rigorously tested before it leaves the factory.

Price—\$40.

### HORIZON HOBBY DISTRIBUTORS Super Sport 1800 Battery Pack

Dynamite's new budget-priced 1800 battery packs are perfect for parking-lot racing and backyard bashing. The 1800s offer longer run times and plenty of punch, and they're great practice packs for diehard racers.

Part no.—DYN1100; price—\$42.95.



## GREAT PLANES Kyosho Nitro Tracker

This is perfect for beginners who want a stylish, rugged, easy-to-assemble vehicle to get into the thrills and spills of nitro-powered monster trucking. The Nitro Tracker comes 80 percent assembled with a Keltron-N composite chassis installed. Huge V-tread tires provide an impressive ground clearance of 1.7 inches, while oil-filled shocks and extra-long A-arms on the double-wishbone suspension deliver the damping and reach to go just about anywhere. The powerful new Kyosho GT-12S-CR engine with easy-to-operate recoil starter has four ball bearings to protect the gearbox. The gearbox also includes a slipper clutch for better handling and "adjustability."

Part no.—30505; price—\$339.99.



### Kyosho Hi-Rider II

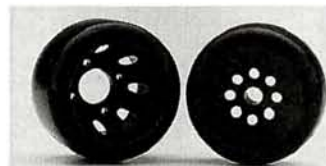
Based on proven Kyosho Tracker technology, the Hi-Rider II has a streamlined, Corvette, street-car body accented with a

chromed engine—dazzling style and car-crushing power. Its lightweight composite-nylon bathtub chassis has been beefed up with chromed truck wheels and high-grip monster truck tires. Oil-filled shocks (excellent damping), a powerful Mabuchi 540 motor and a heavy-duty, rotary speed control round out the package. Replacement and hop-up parts are readily available because many are compatible with Kyosho Outrage Series vehicles.

Part no.—31541; price—\$169.99.

### TRC New Compound Capped Tires

TRC offers capped tires in two new



compounds—Purple and White. If you run on short concrete tracks and asphalt, try long-lasting Purple for fast starts and great traction. The medium-firm White compound's traction characteristics fall between those of the Gold and Silver compounds, but it lasts longer. TRC says that for concrete tracks, try this combo: Purples on the inside (for traction) and Whites on the outside (to take the punishment in turns).

Part nos. and prices—Purple, 4467 (front), \$23; 4567 (rear), \$25; White, 4463 (front), \$23; 4563 (rear), \$25.

### MOTOR MAN Thin CA

Use this to glue tires to rims. The special bottle has an airtight, snap-on top that won't allow glue to harden at the tip.

Part no.—MM8021; price—\$3.99.



### HOT BODIES New Lexan Bodies

A modified version of Ford's new concept truck of the same name, the Triton stadium truck body fits Team Losi's Double-XT like a glove. It captures the vigor of the Ford concept right down to its distinctive front end and stylish flared sides. The truck's roll bar, number plates and rear spoiler make it a real showstopper—and stadium basher!

Part no.—10401; price—\$18.95.



For the Team Losi

Double-X, try Double Vision—a body that was designed to fit the Double-X like no other. It also has air scoops and convenient trim lines—and great decals, of course.

Part no.—10303; price—\$16.95.

New for Associated and Losi cars and trucks, the sleek, easy-to-mount Stealth

Fighter snugly fits Associated's RC10 Team and Worlds

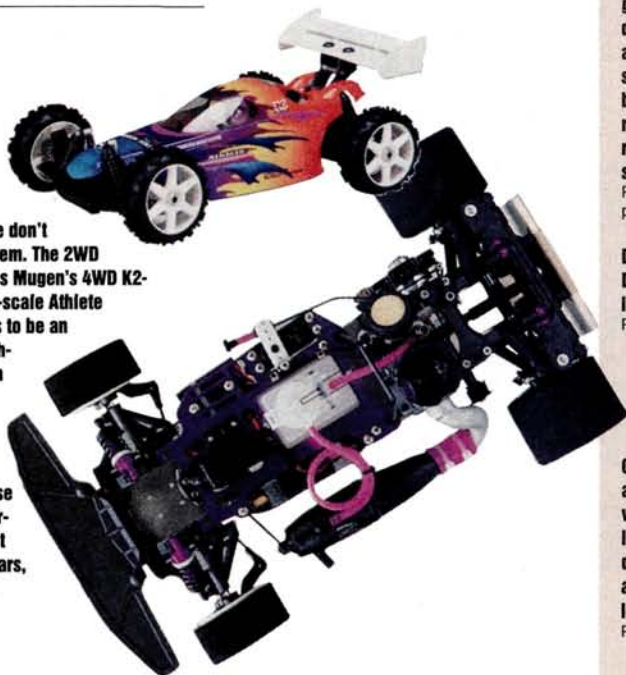
Car chassis. The body also has an ESC inlet with cooling vent, trim lines and a set of hot decals. The optional 4- and 5-Inch Hot Wings look great and are also functional.

Part no.—10302; price—\$16.95.



### MUGEN K2-X295 On-Roader and Athlete EVO Buggy

Just as we were going to press, this arrived from Mugen—cars so new that we don't have much information on them. The 2WD K2-X295 on-roader resembles Mugen's 4WD K2-X495. The other car is the 1/4-scale Athlete EVO Evolution, and it appears to be an entry-level buggy. We've gathered that the EVO comes with entry-level aluminum shocks and bushings. We've also heard a rumor that it has certain updated parts that the team drivers use on their full-blown racing versions of the car. When we get more info on these two hot cars, we'll be sure pass it along.





# NEW for '96

## JAPAN R/C IMPORTS TF-2 Hop-Up Parts

Distributed here by Japan R/C Imports, these Kose hop-up parts for the new Kyosho TF-2 include:

Part nos. and prices—7050 (carbon-fiber upper deck), \$43; 7051 (center belt-tensioner post), \$16.50; 7052 and 7053 (front and rear aluminum suspension arms), \$42; 7013B (front-end reinforcement set),



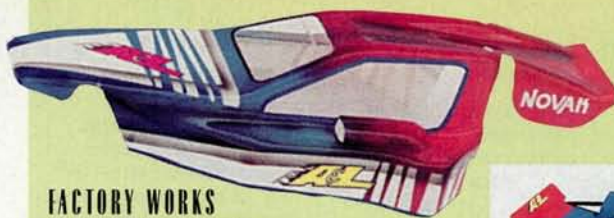
\$35; 7009 and 7010 (front and rear adjustable upper arm set), \$8.50; 7005 (front and rear universal drive shafts), \$40.



## RACE PREP Hack Attack Stock Motor

This new 24-degree stock motor features Race Prep's new R-40 armature, which is divided into four sections to allow air to cool more of the wire's surface area. The weight of the armature is balanced so that its magnetic field is never disrupted. Other features include 5.3 wet magnets, a 1.3mm-thick can, Teflon™-bushing shims, Race Prep's "R"-compound brushes and three capacitors.

Part no.—RP-244; price—\$40.



## FACTORY WORKS XX-YZ2 Lexan Body

This XX-YZ2 body for the Losi XX will fit both short- and long-chassis versions, and the cutouts and body-mount positions are clearly marked for easy trimming. A molded-in air scoop allows extra ESC clearance and helps to cool your controller. The body's tight fit makes your car look slimmer, improves aerodynamics and prevents dirt from accumulating inside the chassis.

Price—\$12.95.

## Eliminator Lexan Body

This body is designed to fit on the Associated RC10T2 without any modifications. It comes with a rear spoiler and a molded-in number plate, and the cutout and body-mount positions are clearly marked, so mounting it is easy; its recessed windows look cool and increase strength, and its narrow front improves aerodynamics.

Price—\$17.95.



## MOTOR MAN

### Monsoon Motor

This 14 triple machine-wound, bushing-equipped, modified motor is very popular with Tamiya sedan racers and is legal for Tamiya Championship Series races.

Part no.—MM1114; price—\$28.



### Stock Master Motor

Motor Man's newest 24-degree motor features the latest in stock-motor technology: a 1.3mm-thick can, 5.2 wet magnets and silver h-cut brushes.

Part no.—MM1003; price—\$39.99.



## HOBBY PRODUCTS INTERNATIONAL (HPI)

### Mini Cooper Hop-Up Parts

These hop-up items for the Tamiya Mini Cooper include: a lightweight graphite chassis set with aluminum standoffs; a super-tough diff gear; trick, machined-aluminum suspension arms; hot-looking, 5-spoke, chrome wheels; and a totally awesome Suzuki RS/7 Lexan body.

## PARMA Mystery Drag Car

This is so new that Parma would only let us show this much of it. In their own words, "Parma International will be releasing the hottest R/C kit of the '96 season at the Chicago Hobby Show...." Well, we'll see more soon!

### Eagle Talon Body

Made to fit Tamiya, Yokomo and Kyosho 4WD sedan chassis, this trick-looking Eagle Talon body is molded out of 0.040-inch-thick Lexan and comes with an add-on spoiler (not shown) for maximum downforce.

Part no.—10217; price—\$21.

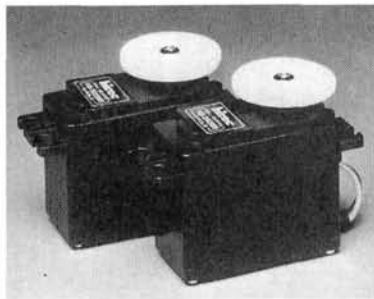


## TRAXXAS Nitro Stampede

The Stampede is one of the most popular Traxxas monster trucks, and now the Nitro Stampede is headed your way. It features Traxxas's all-new, more powerful TRX-12 engine, a disk brake, dual exhaust outlets, a new transmission with a super-low 3.72 final drive ratio, heavy-duty steel and composite gears and a new, even tougher planetary gear diff, a new body, adjustable gear ratios, and much, much more.

Part no. and prices—4110, \$495 (fully assembled, without radio); \$595 (with radio).





### HITEC RCD INC. High-Speed/High-Torque Servos

This precision-grade HS-525BB servo's 5-pole motor means precise servo movement; its top ball bearing ensures smooth operation; and its custom integrated circuit promises reliability. The unit's transit time is a speedy 0.16 second, and it offers 47 oz.-in. of torque. Available with three styles of connector, it's listed at a low price. The HS-545BB servo has the same features and price, but it has 62 oz.-in. of torque and a transit time of 0.22 second.

Part nos.—HS-525BB, HS-545BB; price—\$59.95.



### DAVIS MODEL PRODUCTS (DMP) O.S. RFB .21 Diesel Conversion

Imagine getting 25 minutes of run time on one tank of gas and never having to buy another glow plug for your O.S. RFB .21—ever! DMP's diesel conversion for the big-block .21 is similar to their successful O.S. CZ-R .12 conversion. DMP's owner, Bob Davis, says the diesel conversion is more economical and will boost the performance of your 1/8-scale vehicle to beyond your wildest dreams. He does admit one flaw: it's hard to stop the tires being ripped off the wheels when you peg the throttle!

Price—\$74.95.



### FUTABA Fail-Safe Unit

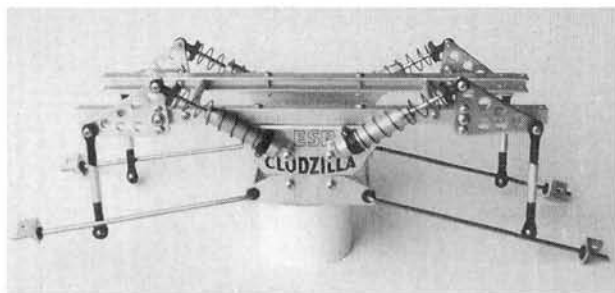
Avoid having your prize R/C vehicle go out of control! Plug this small, light unit in between your servo and

receiver; if you lose your radio signal or it's interrupted for some reason, the servo goes to a setting you programmed in, or to a neutral setting. This is a must for gas-powered cars, and it can also be used with any electric car that has a mechanical speed control. Formerly only available on expensive PCM radios, now you can have a fail-safe option on your inexpensive AM unit.

Part no.—FP-FSU1; price—\$79.95.

### ESP HOBBY MFG. Clodzilla IV Full Race Package

Based on the latest full-scale monster-truck technology, the Clodzilla IV Full Race Package features the smallest, lightest chassis frame ever available for the Clod Buster and Bullhead. Its extra-low profile is also extremely narrow; the battery pack is lengthwise in the bottom of the chassis (helps to lower the truck's center of gravity) and the kit includes: the Clodzilla I lever IV Cantilever suspension kit; the



Clodzilla anti-sway bar kit; the long-wheelbase, multi-link suspension kit; the heavy-duty steering rods with rod ends; and the dual-servo conversion kit

Part no.—ESP045; price—\$299.95



### PRO-LINE Jaco Mounted and Trued F1 Foams

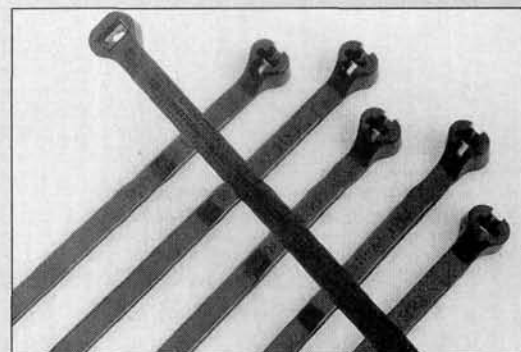
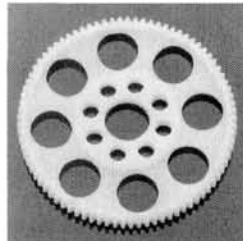
Tired of mounting foam donuts on your Tamiya F1 cars? Well, check out these new Jaco foams. They're completely ready to bolt on and go—no need for glue or tape. These hassle-free tire/1.41 composite wheel combos come in a wide variety of standard and exotic compounds to help you get dialed in to all types of track—everything from carpet to parking-lot racing.

Prices—from \$14.95 to \$27.95

### ROBINSON RACING PRODUCTS 64-Pitch Stealth Silencer Spur Gears

Robinson's new Pro Series profiled spur gears are 50 percent thinner and 40 percent lighter than stock gears, and this means lower rotating mass and better racing performance. Made with diamond-ground master tools, these precise gears improve acceleration and top-end performance. They don't contain any glass that can excessively wear the pinion, and they're available with from 96 to 125 teeth.

Part no.—RRP 1796-1825; price—\$6.50.



### HORIZON HOBBY DISTRIBUTORS Dynamite Thermal Grip Coupler Ties

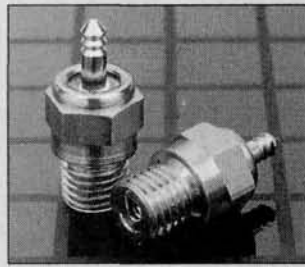
Because standard tie-wraps just aren't designed to handle high temperatures, they often fail when used to secure a header-to-pipe connection on an R/C gas engine. These 8-inch-long, 0.140-inch-wide Thermal Grips are made of a special, black, temperature-resistant material, and the clasp's locking pin is made of corrosion-resistant spring steel. These ties will never be affected by heat, so they won't fall apart during that Main event.

Part no.—DYN 2259 (pack of 6); price—\$1.99.

### Dynamite MC59 Glow Plugs

The MC59 glow plugs were designed to work better than the original MC9s in cold and humidity. Such conditions can make a glow plug cause the engine to idle roughly or load up in the mid-range. Even the MC9 sometimes has problems when the weather is at its worst. The new plug has a higher heat range, so performance is great in the cold and wet. If you're serious about gas racing, you'll always have both MC9s and MC59s in your pit box to match race-day conditions.

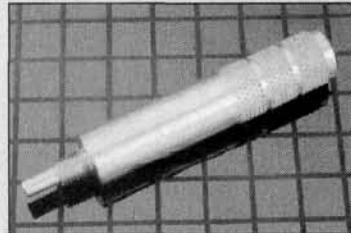
Part no.—DYN2508; price—\$7.49.



### Piston Locking Tool

Without this tool, changing the clutch on your R/C gas engine could be a pain. Just screw the Piston Locking Tool into the glow-plug socket, and it will hold the piston and crankshaft in place. Removing the clutch, the clutch nut and fly-wheel is now a simple operation.

Part no.—DYN2512; price—\$7.95.







by MIKE OGLE

# Building the ultimate CIRCUIT BREAKER



*Project F1 awaits the addition of its sponsor's colors.*

**W**ELCOME TO the first in a series on the creation of Project F1! Step by step, I'll take you through the assembly of the latest high-tech components and accessories until we end up with a dual-threat concours killer/take-no-prisoners parking-lot racing machine.

And, just as *R/C Car Action* did with the previous Project Car (Project '29), we'll be giving this dream car away to some lucky reader! That's right! We'll give away a full-blown, tricked-out already-built racecar with all the side orders! You won't find a better Formula 1 deal than that—unless, of course, your name is Michael Schumacher!



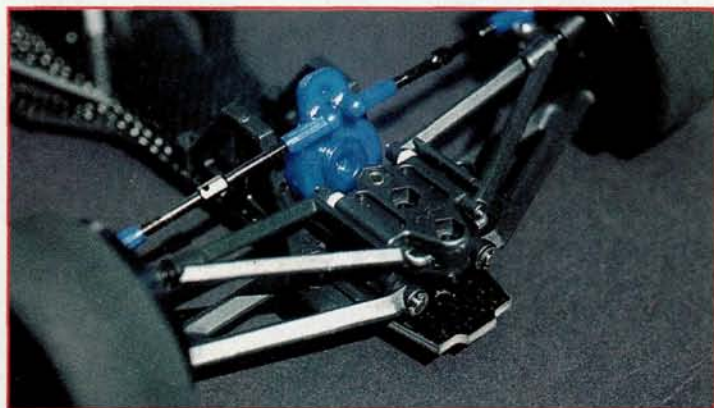
*Instead of being in the usual place, over the kingpins, the front-end springs are inboard, under those little round pivot balls on either side of the front bulkhead.*

## RECRUITING A RIDE

All great racecars start with a great chassis. The annals of racing history are filled with their names: Benetton, Lola, Jordan, Tyrrell, McLaren, Ligier and dozens of others. Every one represents the expenditure of hundreds of thousands of hours and dollars; they're perfectly balanced platforms for exotic, temperamental, million-dollar pow-



*The HPI Graphite chassis' edges are rounded with 400-grit sandpaper. Don't forget the upper chassis plate, upper and lower motor-pod plates and the rear roll-spring plate.*



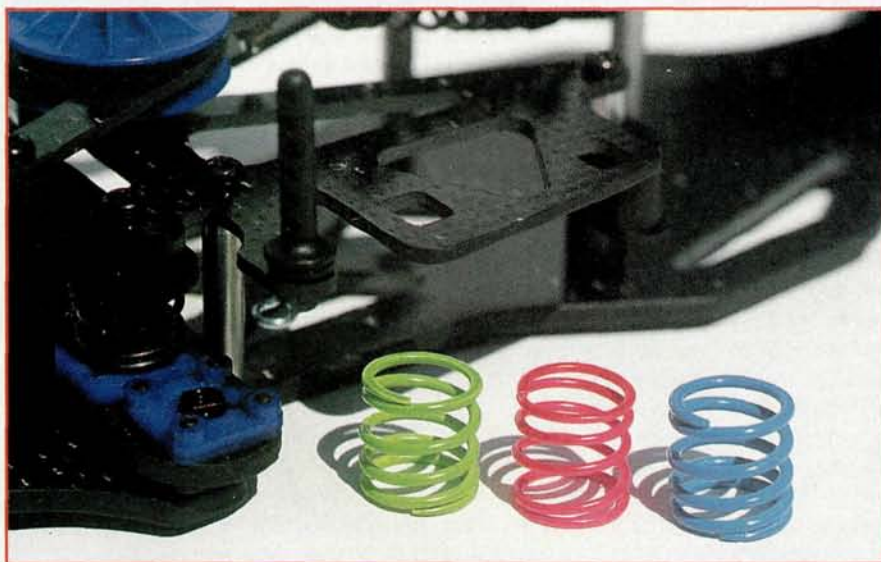
*The completed front end. The extra-long independent front A-arm suspension can be fitted on a late-model Tamiya F1 chassis. With adjustable caster, camber and front spring rates, it gives you significantly more tuning latitude than most F1 kits' front ends.*

PHOTOS BY MIKE OGLE



# Project Formula 1

## Part 1



**Color-coded rear roll springs (from 1.1 to 1.4mm) are available for fine-tuning. Reportedly, many of the local SoCal racers are opting for the lighter springs.**

erplants (and their equally exotic, temperamental, million-dollar drivers)—all in pursuit of world championships!

Fortunately, a number of R/C manufacturers supply relatively affordable, high-tech, purpose-built racing chassis. More than a few have thrown their hats into the ring once occupied solely by Tamiya and brought out competitive F1 parking-lot racers.

After reviewing the current crop of cars, I selected a new HPI Racing\* Limited

Edition graphite F1 chassis as the basis for Project F1. Why? Because it's one of the best-engineered kits on the market.

It has it all:

- a fully independent front end with adjustable caster and camber;
- super-stiff, but light, graphite components;
- oil-filled shock- and friction-plate-damped rear end;
- $\frac{1}{10}$ -scale, on-road wheels—the common type, so I could easily experiment with a

wide range of tire/wheel combos.

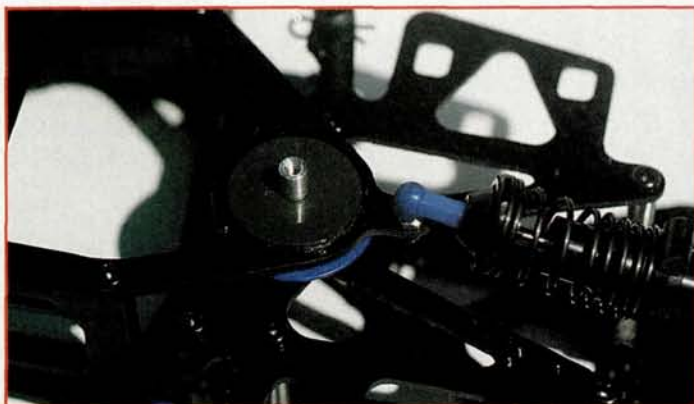
And it looks cool! Just one look at that low-slung, lean meanie gets my throttle finger a-twitchin'! Gentlemen...start your screwdrivers!

• **Prep the chassis plates.** Before we start bolting together the graphite chassis, we'll smooth the edges of the chassis plates with a small file and some 400-grit wet-or-dry sandpaper. No, it won't increase speed or make the car hug the corners any better, but it will help you to avoid getting a nasty graphite splinter in your finger. Remember that you'll handle the chassis a lot while you assemble the car—and even more when you race it; rounding the rough edges makes the car a pleasure to handle.

As a bonus, many of the kit's parts, e.g., the trick independent front end, will fit a Tamiya type 103 chassis, so even if you already have a Tamiya F1 car, you'll probably find some useful information you can use to trick it out.

### PRE-SEASON SUSPENSION TWEAKS

• **Front suspension.** HPI's "neato" independent front end blends some familiar concepts and components and some really unique geometry. The molded upper and lower A-arms are strong enough to take the abuses of



**To get the rear friction plates to move around really smoothly, I installed a set of Parma/PSE Teflon™ damper disks. The high-quality, aluminum, coil-over, oil-filled rear shock works great; no need for aftermarket replacements here!**



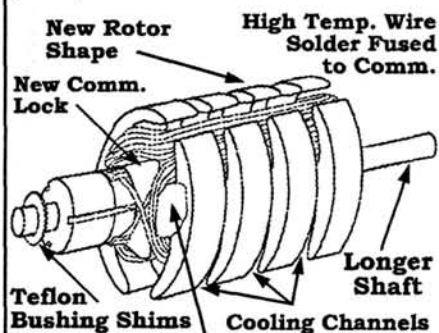
**The HPI F1's rear diff is of modern design (no thrust washers) and features twin ball bearings as standard equipment in the Graphite kit.**



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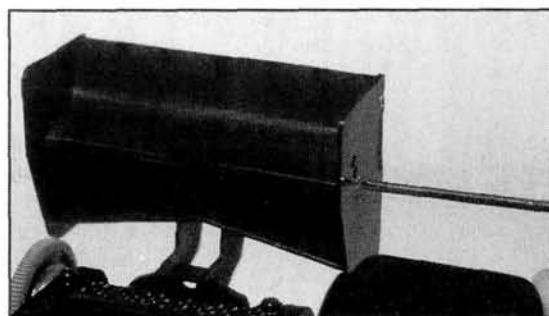
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racing, but thin enough to give a pretty good scale appearance.

The seemingly bulletproof machined-aluminum front axles have a solid block at their base, which also holds the kingpin. They're drilled with two holes, so you can choose whether you want the axle to trail the kingpin (increases straight-line stability), or be directly in line with the axle (for quicker steering response). HPI recommends the "milder" trailing-axle position, and I wanted this car to "drive friendly," so I went with their suggestion!

The front springs (0.8mm) are unique in that they aren't on the kingpin, as you'd expect, but they're way inboard on the bottom of the lower suspension arms next to the hinge pins. HPI's Kent Clausen kindly sent a couple of front-spring options: 0.7mm and 0.9mm. For even smoother steering, the kit comes with extra rubber O-rings that you can use in place of the springs. Again, because I don't know who'll eventually race this car and where, I set it up to be very forgiving.

• **Rear suspension.** The rear end is also a refreshing blend of the familiar and the unique. At first glance, the rear pod looks like a typical "tennell" damper/friction plate setup, but it's mounted on the chassis by means of lateral pivot balls instead of the typical T-bar setup; chassis roll is con-



**The triple-element rear wing's largest, top deck is adjustable for more or less rear-end downforce. Initially, we'll set it up for max bite and then, by making front-end adjustments, we'll add enough steering to defeat any resulting "push."**

trolled by springs. I like this setup a lot, because the rear pod seems to "center" better than just depending on the friction plates to bring the pod back to neutral. Again, there's a ton of "adjustability" in this end of the car.

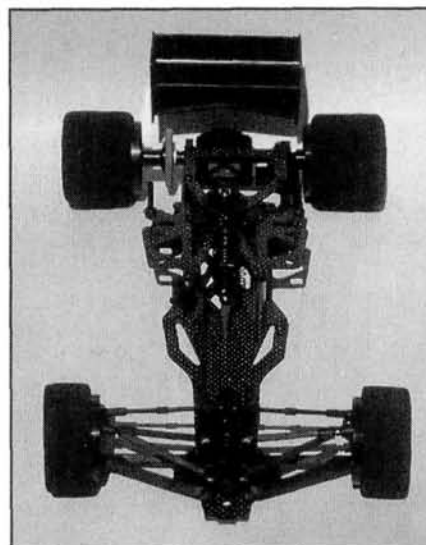
The supplied springs are 1.2mm long, and optional rear roll springs (Orange—1.1mm; Green—1.3mm; and Blue—1.4mm) are available to suit a variety of track conditions. For the smoothest possible action, I also opted to install a set of adhesive Teflon® disks between the friction plates.

Molded in white plastic, the rear suspension parts (parts tree no. A004) include the damper washers and suspension ball sockets; I dyed them a royal blue to match the eventual paint scheme (which replicates the '95 Mild Seven Benetton car of Michael Schumacher). The Graphite version of the HPI kit comes with a black-anodized-aluminum shock body and 50WT shock oil—all high-quality stuff here; no plastic shocks or the too-familiar "nail-with-a-spring" being passed off as suspension.

### FINISHING TOUCHES

HPI includes a great-looking, true-to-scale "bent" rear wing (royal blue to fit the Benetton color scheme); up front, I opted for a Benetton wing—strictly for its looks, and it's a choice that only a scale fanatic might make. But, hey; that's part of the fun of these F1 racers: they can look good and run competitively.

In Part 2, I'll outfit the chassis with some of the latest state-of-the-art radio gear, an electronic speed control, a motor and batteries. As we get closer to the completion of the series, I'll fill you in on the details of how you can enter to win Project F1. So keep watching; this could be your next racecar!



**The completed chassis, ready for the motor, battery, ESC and radio gear. Most of the white nylon parts—including the Kimbrough\* servo-saver—were dyed royal blue.**

\*Addresses are listed alphabetically in the Index of Manufacturers on page 264.



# HOW TO

# Touring car Tuning Techniques



by DOUG MERTES

Make  
your  
parking-  
lot racer  
do what  
**YOU**  
want it to

**W**HIRRRR...Zzziiip...Ponk! "Ouch!"  
Whirrrr...Zzziiip...Ponk! "Darn!"  
Whirrrr...Zzziiip...Ponk! "That's it! I'm  
packin' up."

So, you went ahead and bought this super-adjustable, complex-o-tronic sedan because you just knew it would make you the fastest driver in the state. You spent a week's worth of late nights putting it together and painting a really cool body for it. There's a whole bunch of cash tied up in this thing now, as well as a lot of your sweat and time. Unfortunately, your new ride doesn't seem to appreciate your efforts. It doesn't glide through the corners as if it's on rails; it's whacking every corner like some sort of insane billiard ball. Instead of looking like Joel Johnson, you're driving like Joe Idiot. How come? 'Cause you don't have the right setup.

I'm sure you've witnessed this sad scene before; I've experienced it more than once myself. It takes a lot of experience to develop chassis and suspension setup skills in any form of racing.

We'll take a look at some setup basics and get you started in the right direction. Then, we'll go over some specific setup tips for

your parking-lot sedan car. By the time we've finished, you'll be able to tell the difference between "tight" and "loose," and you'll know how to get both ends of the car to do what you want them to do.

## BASIC BASICS

There are some simple rules to remember when setting up your sedan.

- You don't have to spend a lot of money on go-fast stuff to go fast. Often, you only have to maximize what you already have to be a frontrunner.
- Start by spending your money on things that will allow you to adjust your vehicle's traction, suspension and gearing. Fast motors and expensive batteries are useless if you can't put the power to the ground or get around a corner.
- Change only one thing at a time, then test for results. Making several traction and suspension adjustments at the same time will only confuse you; you won't know which adjustment produced which result.
- Keep a setup journal so that you know what change you made and what difference it made to your car's handling. Often, you'll only have to refer to your journal to resolve a



handling problem. A simple spiral notebook works well, and it fits neatly into your toolbox.

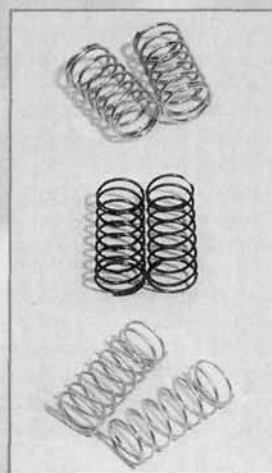
- Learn how to measure. Keep a set of inexpensive calipers in your toolbox (K&S\* makes a set for less than five bucks). Also have a small, flexible, plastic ruler. Small measurements can make big differences.
- Ask around and observe. Don't pay attention to the car that's hideously fast but spins out or bangs the wall on every other corner. Watch the cars that run a consistent line quietly and smoothly. They'll turn out to be the fast guys.
- Buy a decent stopwatch. Forget the stopwatch function on your wristwatch; spend 30 or 40 bucks on a good stopwatch with a lap-counting function so that you can review your laps over several minutes of running. Going fast for a lap or two won't get you to the front; going fast for the entire race will do the trick, and you'll need to know the difference.
- Beginning drivers need the security of having a car that "pushes"—or understeers. A car that's set up to push will have to slow down to get around a corner, and that's a good thing for novices. They need plenty of rear traction, because they find it maddening and frustrating to spin out. A car that has spun out is also right in the path of every other car coming down the track, and that spells b-r-o-k-e-n-p-a-r-t-s.
- More experienced drivers can handle a car that's "loose" or on the verge of oversteer. These drivers have steadier hands on their steering wheels and the hand/eye coordination necessary to keep their cars under control. Looser is also faster, because less time is wasted slowing down for the turns. If you can keep the throttle on through the turn and hit

## Shocking Developments

I use regular old stock shocks on my sedan cars; I've tried others, but none—including the manufacturer's own upgrade shocks—seem to offer any performance advantage. I also use the manufacturer's recommended ride height for the car: one thick and one thin spacer on Tamiya cars—no more. Yokomo\* cars run without any spacers, but some of the Kyosho\* and Schumacher\* cars use them. Check your car's manual. I've tried reducing the ride height, but that has never given me any gains in handling. You might be able to go faster on a super-smooth track, but most of us run on parking lots that include dips, small holes and bumps. Low cars tend to snag on that stuff and break shock towers and hub carriers. A car that's set to normal ride height also has enough body roll to slow down left/right transition in the turns. That's a good thing because, otherwise, the car will rebound after a turn and snap around on you unexpectedly. Leave the low ride heights to the carpet guys.

Get some 20, 40, 60 and 80WT shock oils. Trinity\*, Associated\* and Losi\* make high-quality silicone shock oil that won't thin out on hot days and turn into Karo™ syrup when it gets a little chilly. Use the two-hole (or medium)

shock pistons, and start with 40WT in the back shocks and 80WT up front; but take the oil with you when you go to the track. I've often had to go up or down in the front or the rear to respond to surface changes. Next to tires, shock oil makes the biggest differ-



ence to traction.

Buy some Associated front shock springs in green, silver and black. The colors indicate the spring wire's thickness. Blacks are the softest, and silvers are the hardest. So that I'll remember which wire has which thickness, I keep a notebook with me and write down the information that comes on the parts header card. They fit the Tamiya and Yokomo shocks perfectly, but

because they're slightly longer than stock Tamiya and Yokomo springs, you'll probably need fewer, if any, spring pre-load spacers.

When you set ride height, you want the shocks to return to just a little less than full extension when a fully loaded chassis is pushed down and allowed to rise back up. Too much pre-load will make the car go *boingo* and "jitter" all over the place; too little will make it saggy and lazy. You'll figure out what I mean. Shock oil and springs work together to keep the tires on the ground as much as possible, and they're the third weapon in your traction arsenal.

There may be times when you can afford to further reduce your car's rear traction and make it corner flatter and faster in the bargain: install a well-engineered anti-roll bar on the rear suspension. You'll usually end up with a car that kicks its back end out before the front end slides. It's an interesting, amusing and rapid way around a racetrack, but it will also wear out some rear tires. Most people should leave the rear anti-roll bars to those who race on flat, carpeted surfaces, where anti-roll bars are almost a necessity to prevent cars from rolling in the turns.

**H**ave you ever taken a really close look at the available sedan bodies? Some of them have really steep front-end angles, and others have very blunt ones. Some have humungo rear wings, and others have little teeny ones. Wider bodies more easily accommodate wide wheels and tires in the back, while

narrower bodies are better suited to stock wheels and tires.

Borrow a couple of bodies from some of your

fellow racers for a few laps to see what effect they have on your car's handling. For instance, a Tamiya Mercedes-Benz ProMarkt or D2, or an Elite Mercedes Evolution body will give you a lot more steering than a round-nosed Skyline, Escort or Supra. The Opel Calibra bodies from Tamiya, Trinity and HPI have a little lip in the front of the bodies that seems to hold the air better than some of the other



**Different bodies produce different amounts of front and rear downforce.**



bodies; it's great for adding a little steering to a car that pushes. The blunt-nosed BMW M3 from Elite and the Audi Quattro from HPI are great bodies for drivers who like a lot of rear downforce but not much steering from their bodies. Granted, it's possible for your car to handle great with any of these bodies, but you should be aware of the differences that each of them can make to your car.

## Body Differences



# Tire Buyer

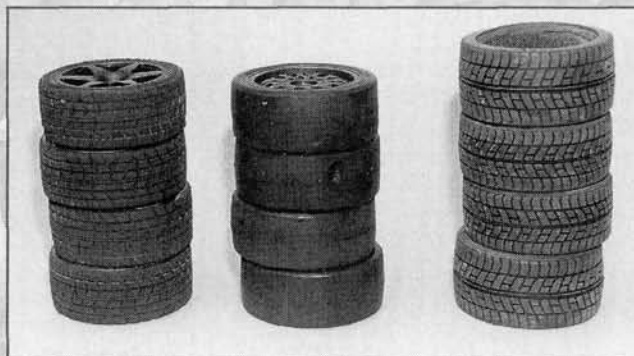
**D**on't think that you have to buy every kind of tire available. Poke around the pits, and find out what seems to work for the drivers whose cars run more smoothly. You'll get a couple of opinions, and you'll probably wind up buying two or three sets of tires and rims. That's not cheap, but it's worth every penny. Parking-lot surfaces can change drastically according to temperature, how recently it rained and whether the sun is out. You'll need tires that will handle slippery to tacky surface conditions.

When people ask me which tires to buy for their sedan car, I generally have several recommendations.

- Stock kit Tamiya\* slick and radial tires with very soft, thin, foam liners work especially well if you use the kit motor. To balance out the traction on any given day, you can mix slicks and treads on the front and rear as necessary.
- HPI\* Super Radials are good all-around tires that I mount on HPI's excellent rims; I probably run them the most. I use wide on the back and regular width on the front. The "V" in the tread should point toward the front of the car.
- Pro-Line\* Sedan Hawgs are some of the stickiest tires available. If you have a situation where you need a ton of traction, these are the tires to get.
- If the track is regularly cleaned or treated with some sort of trac-

tion enhancer, i.e., sugar water or VHT, start with HPI slicks, which are available in narrow and wide. These tires generally don't work well on dirty or unswept parking lots, but they're the hot ticket for a real racing surface.

Tires probably make the biggest difference to traction. You can get almost any 4WD car to handle well by swapping tires until you find the right combination for that day on that car. When I first put my car down on a new track, I spend my first couple of runs trying to find a good tire combination. Then I move to the more subtle tuning aids to drop the last couple of tenths in lap times.



**You need several sets of tires in your tuning arsenal; get some soft, treaded tires as well as some soft slicks. The tires that came with your car are usually pretty good, too!**

## Troubleshooting Handling Problems

### COMMON PROBLEMS

**Your car spins out in almost every turn and weaves all the way down the front straight.**

#### Too much front traction!

- Use a softer, wider, treaded tire, such as the HPI Super Radial, at the rear.
  - Install a harder, lower-traction front tire, such as a Tamiya Radial or Slick.
  - Check the ride height: dogbones level in front; dogbones a little above level in the rear. The front of the chassis should be a little lower than the rear.
  - Use a shock oil with a lower weight in the rear shocks.
  - Use a softer spring on the rear shocks; maintain proper ride height.
  - Use a shock oil with a heavier weight in the front shocks.
  - Use a stiffer spring on the front shocks.
- By now, if your car doesn't run well, you should make sure that both front and rear diffs are operating and that the wheels or dogbones aren't locked up on one side.

**L**et's say you get to the parking-lot track, and your car exhibits undesirable handling characteristics. What do you do first? Here are some examples of setup changes. Remember to make only one change at a time, test it, and then make the next change.

**Your car won't go around the corners very well; it plows through them even with the front wheels at full lock. The car feels very lazy through the infield, even though it has plenty of speed on the straight.**

#### Too much rear traction!

- Swap front and rear tires, and make sure that the tread still points in the proper direction. Don't bother if they're the same, i.e., both sets are Pro-Line Sedan Hawgs. Those things stick like glue, and I love 'em.
  - Go to a harder, narrower tire on the rear.
  - Use a heavier-weight shock oil in the rear shocks.
  - Use a stiffer spring on the rear shocks.
  - Try the anti-roll bar.
  - Install a body with a steeper front-nose section.
- If you still have the problem, put in another motor; yours may be dying a slow death and have too little bottom-end power to bring the chassis around in the turn. You may also have geared the motor incorrectly. If your motor is really hot after just a minute or two of running, drop the pinion by a couple of teeth and see what happens.

the apex just right, you'll lower your lap times.

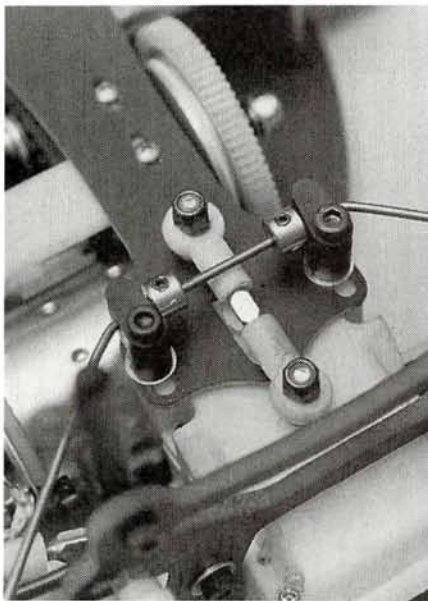
### SETTIN' UP YOUR PARKING-LOT SEDAN CAR

• **Traction action.** Remember I told you to spend your money on traction- and suspension-oriented parts? That means buying tires in a variety of compounds, tread designs and widths as well as shock oil in a couple of weights, some shock springs and, possibly, a new body. Depending on the track you run, your driving style and your experience, you may have to add an anti-roll bar to that list. These parts will allow you to adjust the traction at both ends of your car and, ultimately, will get you to the finish line ahead of the competition.

A car that spins out in a turn is said to be loose, or to oversteer. If you zip down the front straight, turn into the infield and find yourself going the wrong way, your car oversteers. Even very experienced drivers can find it difficult to control a car that handles this way. More traction in the front of the car than in the rear causes this spinout.

A car that won't get through a turn at speed even when the steering is cranked all the way over is said to be tight, or to understeer. If your car won't go through the turn at the end of the straight without slowing to a crawl, your car understeers. And yes, you guessed it, this is caused by having more trac-





An anti-roll bar works well when you can afford to reduce rear traction on a smooth track.

tion in the rear of the car than in the front. Of course, there are variations of both understeer and oversteer.

A car that drifts through a turn without losing speed and remains under control at full throttle while negotiating a turn, is said to be "neutral." If, on the straightaway, your car passes everything in sight because it has maintained its momentum through the previous turn, and after the straight, it does a four-wheel drift through the corner and sets a new track record lap time, it's probably set pretty neutral.

How do you get your car to that neutral handling condition?—through traction management. By using the right tires, shock oil, springs, settings and body type, you will be able to amaze your friends, win a few races and take home a trophy.

#### THE BIG FINISH

The whole point of this article is to let you know that you don't have to just *accept* the way that your car handles. You can change it all around very easily and make it do *what you want it to*. To get to neutral handling, you'll have to think and experiment and take notes, and think and experiment some more. And then do some more thinking. In the end, you'll have a lot of fun, you'll go a lot faster, and you'll be a much better driver. Isn't that what this hobby is all about?

\*Addresses are listed alphabetically in the Index of Manufacturers on page 264.

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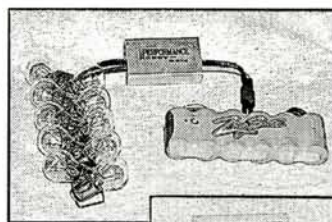
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# Equal Opportunity Racing

by Rick Schwartz

Does your track accommodate the physically challenged?

**Y**OU'VE WORKED on your car all week getting ready for the big race. The diff is as smooth as silk, the shocks have been rebuilt, and everything is working perfectly. You get to the track early to set up your pits, charge your batteries and get ready for a full day of competition. When your heat is called, all the other racers head up the stairs to the drivers' stand for a perfect view of the track. You can't go! You've been told you have to drive your race from ground level. Wait a minute—that's unfair! You'll be at an extreme disadvantage. You protest loudly! "Why am I being penalized? How do you expect me to compete on an equal basis?" Pretty bleak, huh? This, ladies and gentlemen, is what disabled and wheelchair-bound racers face at most tracks every time they compete.

## TOO MUCH MONEY FOR TOO LITTLE USE

One of the great aspects of R/C racing is that it provides an opportunity for everybody to compete on an equal level. It doesn't matter whether you're young or old, male or female, tall or short, heavy or thin; everyone has access to the same equipment—well, almost everyone. The area that has been sorely overlooked is accessibility for racers who, for whatever reason, are unable to walk up the stairs to the drivers' stand. The two arguments (excuses) for this are: there aren't enough physically challenged racers to justify building a ramp, and it would cost too much to build one in compliance with ADA (Americans with Disabilities Act) federal, state and local regulations. The resolution to this dilemma isn't easy, but with a little effort, it is attainable.

## COMMUNITY EFFORT

The first step is to contact schools and organizations that work with the physically challenged in your area. Introduce them to R/C racing, and make them aware that all a participant needs is a willingness to compete. Invite them to a race or practice, and allow them to drive a few practice laps. There are not a lot of competitive activities available to wheelchair-bound individuals, and this could open up the world of R/C racing to them. These organizations can help your group resolve the two previously mentioned problems, too. Their networking connections will make your track known throughout the community and increase the number of racers who participate. They're also very good at helping to organize fund raisers, and they'll know who to contact about ADA regulations.



Ramp at Coral Springs Roadrunners' track.





**Gregg Newman, Adam Meiggs and Eric Cappozzoli race on an equal basis with the other drivers.**

### STRICT COMPLIANCE?

The next step is to determine what is required at your facility to meet the building code and what it will cost. Usually, the local building department or a contractor who specializes in ADA projects can help to design a ramp for your facility. This is where the process can get a little sticky. The law requires that the ramp be 1 foot long for every inch that it rises. This means that if the drivers' stand is 5 feet high, the ramp must be 60 feet long. In most instances, this would be physically impossible, especially for an existing drivers' stand. After much research and several discussions

with attorneys who specialize in this aspect of the law, we found that exceptions can be made. In the ADA Accessibility Guidelines, Appendix IV, Section 4.1.6—Accessible Buildings: Alterations (j), there is a waiver for strict compliance with the code if the addition is "technically infeasible." It doesn't release your group from compliance with the law, but it may allow you to build a facility that won't break your bank. Remember, before you do anything, check with someone who has expertise in the matter. The key phrase to remember is "substantially compliant."

### A TOUGH CALL

I've been involved with R/C racing for more than eight years. I've been to national events in which physically challenged racers have been carried up the stairs to the drivers' stand. No one seems to mind, but maybe that's because the physically challenged racers have no choice. The positive side is that every R/C participant I know is more than willing to help these racers. The question is, "Is that enough?" Building a facility that can accommodate wheelchair-bound racers can be a time-consuming, expensive proposition. Will the number of physically challenged racers who use the facility justify its construction? If you've ever been to a track that has these facilities, and you've seen everyone competing on an equal basis, I'm sure you already have your answer. So, why

don't you work on promoting accessibility for everyone at your track. ■



**Adam Meiggs drives down the ramp after his qualifier has finished.**

## the ADA

**T**o find out more about the intent and history of the Americans With Disabilities Act (ADA), I spoke with Jack Humburg of Abilities of Florida, an organization that provides information and assistance related to compliance with the ADA. I also spoke with L. Jerry

**One of the great aspects of R/C racing is that it provides an opportunity for everybody to compete on an equal level. It doesn't matter whether you're young or old, male or female, tall or short, heavy or thin.**

Cohn, a Florida attorney who specializes in representing disabled clients. The Act was passed in 1990, and it expands on the Civil Rights Law of 1964. The intent of the law is to provide equal accessibility and employment to handicapped Americans and to ensure that individuals are not discriminated against owing to their particular disability. For more information regarding the law and its implications, you can call the U.S. Department of Disability and Business Technical Assistance Center at (800) 949-4232.



# TECH HEAD

by Frank Masi



The display on this KO-Propo\* EX-10 radio shows that the throttle curve is set two percent to the positive side. The "F" on the display shows that the setting is for forward throttle.

## Getting dialed with today's high-tech radios

**H**ow many of you own expensive, high-tech radios? OK, how many of you know how to use 'em? That's what I thought. If you're one of those people who bought a new computer radio just to impress your buds, you should know that your hi-zoot radio can actually make your car much easier to drive!

### THROTTLE CURVE

The first thing you'll want to mess with, especially if you're running electric off-road, is your radio's throttle adjustable rate control (ARC), or "throttle curve." Throttle ARC is the best way I know to

control wheelspin on slippery tracks. It also makes your driving more efficient, because your car spends less time in "full-punch" mode.

Most radios come pre-set with linear or "straight line" throttle control—response that is directly proportionate to how much you move the throttle trigger. Throttle ARC lets you change linear throttle response to a curved response—either positive or negative (see Fig. 1).

For example, if you set your radio's ARC to a negative value, throttle response will be slow at first, then become pro-

gressively faster after you've moved the trigger past the halfway point. The more negative the value, the greater the difference between the "curved" throttle response and that of the linear response.

Conversely, if you select a positive value for the throttle ARC, throttle response will initially quicken and then slow after the halfway point. I can't think of a situation in which you'd want quicker throttle response early in the trigger's throw.

To experiment with throttle ARC, set your transmitter's display screen to the ARC or throttle-curve mode, and place your car on the track and head up to the drivers' stand. If your radio has an adjustable potentiometer for setting ARC

(such as Futaba's\* Magnum PCM), take your little screwdriver with you. Start driving your vehicle, and note the throttle response. After two laps, stop the vehicle and adjust the throttle ARC to negative 10 percent. Drive for two more laps. The throttle will seem to have more midrange, i.e., you'll have to pull the trigger a little farther to get the vehicle up to speed. If wheelspin still occurs, set the ARC to a larger negative value. At slower speeds, keep doing this until wheelspin is virtually eliminated. Also, no matter how you set the throttle ARC, your vehicle's full-throttle setting will not be affected by it.

### STEERING CURVE

Do you have a super-quick steering servo but not the reflexes to control your car? Your radio can be set

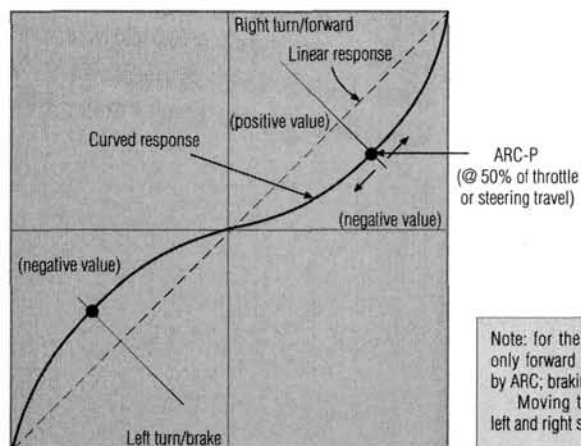
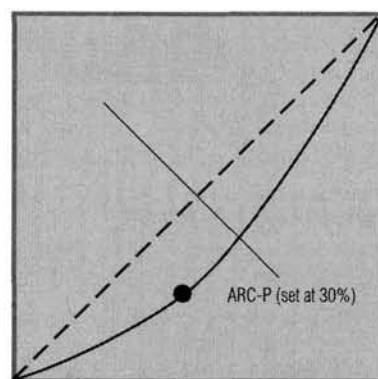


Fig. 1. The effect of adjustable rate control (ARC)



The ARC-P setting changes the point at which the greatest change from linear to curved response occurs.

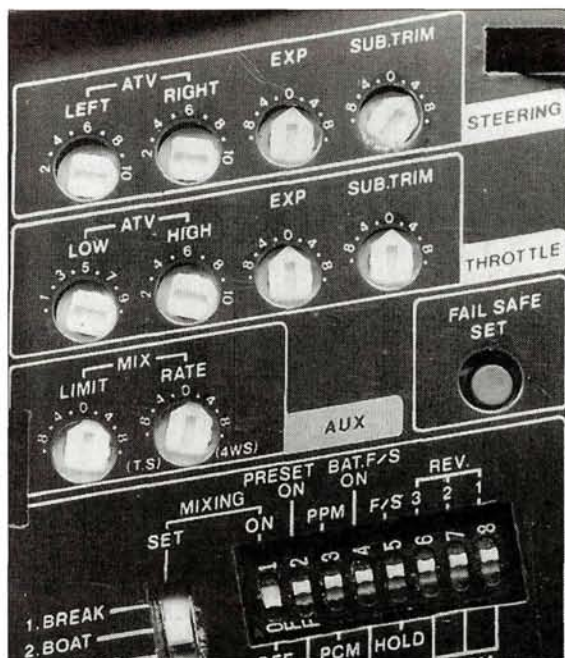
Fig. 2. Moving the adjustable rate control point (ARC-P)



to slow your steering servo's response in the same way that it slows throttle response: set your radio's display to the steering ARC function, and follow the procedure you used to set the throttle ARC: drive for a few laps; stop; and set the steering ARC value to a larger negative value; repeat this until the steering response is in tune with your driving style and reflex speed.

So, why would you want to slow your steering servo, especially when you've paid big bucks for its lightning-quick action?—because of torque. Most high-torque "super" servos offer fast transit time. You want the torque, but for some applications, these servos can be too fast and might even slow you down.

If your car's front wheels are turned at an angle greater than that needed to negotiate a corner, the resulting wheel scrub significantly reduces



**This control panel belongs to a Futaba\* Magnum PCM radio. This radio has potentiometers to set its functions instead of the LCD display and microprocessor that many other systems have. The "EXP" (exponential) pots control the throttle and steering curves.**

corner. If you set the radio's steering curve to a negative value, the steering-wheel movement will not be proportionate to how far the wheels turn; you'll have better control over steering response

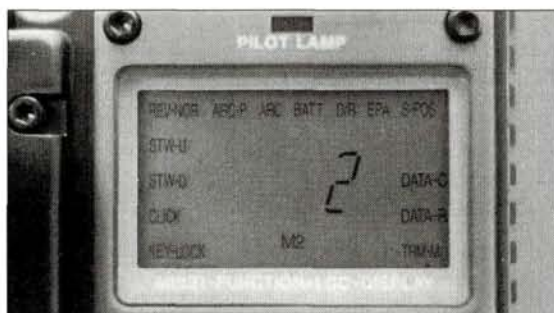
the steering- or throttle-curve ARC point, i.e., the point at which the greatest change in throttle or steering response occurs.

Normally, the ARC point is at 50 percent of the steering or throttle travel, i.e., at half-throttle or at half of the steering wheel's travel. After this point, response quickly curves back down to linear response.

By adjusting the ARC point, you can change the shape of the curve (see Fig. 2)—closer to or farther from neutral (for throttle), or center (for steering). I leave the ARC point at 50 percent for both throttle and steering to provide the most consistent "feel."

I hope you're on your way to becoming a "radio-active" racer. As always, keep those letters and e-mails coming. If there's a topic you'd like to see addressed in this column, write to Tech Head, c/o Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897, or e-mail frankm@airage.com.

\* Addresses are listed alphabetically in the Index of Manufacturers on page 264. ■



**This is the display screen of an Airtronics\* Caliber transmitter. Highlighting the ARC function allows you to alter the throttle or steering curves. This radio also has an ARC-P function that allows you to alter the exponential curve.**

the amount of speed your car carries through the corner. Scrub is when a tire slides sideways, against the car's direction of travel. People tend to confuse wheel scrub with "lots of steering," but in reality, scrub is just slowing the car enough for increased low-speed steering.

Ideally, your car's front wheels should steer just far enough to make the

because you'll be able to make minute control movements and corrections while steering.

Changing the steering ARC to a positive or negative value does not affect full-steering travel.

#### SETTING THE THROTTLE/STEERING CURVE POINT

Some radios have a function that allows you to set

## ROLL YOUR OWN!

If you race with foam tires, you need a tire truer. MAXMOD offers several sizes to suit your budget.

**Check these out!**



**Bench Racer DC Truer PN 10-003**

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MAXMOD tire truers include adaptors for 1/10 and 1/12 electric pan cars. Many other adaptors are available.

**GET SMOKIN' with**

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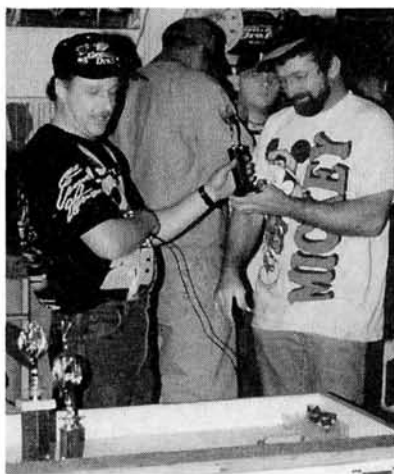
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From the track to the parking lot.  
This is the R/C action as **you** see it.

# Grassroots RACING

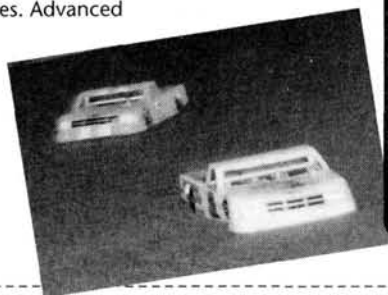
**T**his is YOUR PAGE—YOURS!! It belongs to you, the optimistic local racer on a budget who's looking for some evenly matched action; the individual who's in it for the fun of it all: the grassroots racer—whether on-road or off-road. We at *Car Action* really do want to see your tracks, your cars and your local heroes—men, women, boys and girls (we love cats and dogs, too!). Show us your local racing scene! Send photos with captions to "Grassroots Racing," *Radio Control Car Action*, 251 Danbury Rd., Wilton, CT 06897-3035.



## CCR—Carolina Style

**T**he racers at the Sandhills Raceway in Aberdeen, NC, have developed cost-controlled racing (CCR) programs for drivers of every skill level. For the beginner, there's a large Legends class. Intermediate-level drivers can race in the Novice Truck class; they run oval chassis with a Legends motor, a fixed gear ratio and Trinity Street Spec tires. Advanced drivers are required to use a modified Procar motor, a fixed gear ratio and Trinity's Street Spec tires; aside from that, anything goes.

**Left: Ernie Roberts receives his first-place trophy for the Legends class A-Main. Right: two supertrucks roll out of turn one.**



### call now!

Whether you're a dealer or just a bunch of fun-lovers in search of a race program, call now! Here are a few hotline numbers to call if you have any questions, or if you'd like to start a program in your area.

**Bolink Legend Series**  
(404) 963-0252

**Tamiya R/C Championship Series**  
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**Kyosho R/C Sport Racing**  
(800) 682-8948 ext. 085F

**Hobby Shack Parking Lot**  
(714) 964-8846

**Hobby Town USA Parking Lot**  
(402) 434-5050

**Trinity's Street Spec Series**  
(908) 862-1705

## RACIN' IN RACINE

**E**ighty-nine entrants turned out to participate in the 17th Tamiya Championship Series race, which offered heavy parking-lot competition in all of the six classes. The event also attracted a large number of spectators—99 to be exact—from the Racine, WI, area.

**Top right: racers took advantage of this photo opportunity before the qualifiers got under way. Bottom left: the winners from all six classes gather in front of Gary's Hobby Center—the host store and one of Tamiya's official Regional Qualifier sites for the U.S. Nationals.**



### WINNERS

**F1 Stock**  
James Arnold  
Michael Lemanczyk  
Alex Kikel

**F1 Modified**  
Ken Jones  
Jeff Howard  
Greg Hilber

**Sedan Stock**  
Jim Scott  
John Wicht  
Joe Grimm

**Sedan Modified**  
Tom Knuth  
Scott Ernst  
Nathan Johnson

**GTO/GTP**  
John Wicht  
Scott Ernst  
Ken Jones

**4x4 Race Truck**  
Scott Ernst  
Frank Krivita  
Brad Johnson



# CRA Hosts the ROAR Region 11 Championships

**C**ompetition Racing Association (CRA) proudly hosted the ROAR Region 11 Off-Road Championships held at Aero Sports and Hobbies in Portland, OR. The CRA officers diligently prepared the impressive track, which included an elevated section, stairs, a tabletop jump and a major double jump. Throughout the event, racers from all around the area did their best to become the top driver in one of the seven classes. It was a weekend full of fast, furious racing and nail-biting excitement.

Qualifiers were held on Saturday. The first round saw some very fast runs on the fresh track for the 2WD Stock and Stock Truck classes. John Valentia took TQ in 2WD Stock with a time of 12/4:18.19, and Cary Bennett, ROAR national champ, earned TQ honors with his third-round pace of 11/4:04.69. Qualifying in the Mod classes was marked by some very close competition. In 2WD Mod, six drivers boasted 12-lap runs. In Gas Truck, only 12 seconds separated TQ Craig Ricci from seventh-place qualifier Billy Wilson. The CRA also added a Newcomer class, which isn't recognized as an official event, but does give novices a chance to race among the bigger boys.

Held on Sunday, the Mains also featured exciting racing. Racers in all classes fiercely challenged one another for the first-place trophy; but by far the best race of the weekend had to be the 2WD Stock D-Main. Jeff Day and Earnie Beasley put on a great show of sportsmanship. Jeff waited for Earnie to catch up and make a race of it—not just once, but four times. They battled side by side, lap after lap. In the end, Earnie—who went to the track with no equipment and borrowed a car to race—took the win a mere 0.12 second ahead of Jeff. These two really proved the notion that R/C racing isn't just about winning.

## WINNERS

### 2WD Stock

John Valentia  
Terry Schultz  
Jason Peffers

### Truck Stock

Cary Bennett  
Ron Smith  
Doug Nelson

### 4WD Modified

Jeffery Phelps  
Kevin Patrick  
Jack Leighan

### 2WD Modified

Scott Brown  
Chris White  
Clayton Petree

### Truck Modified

Scott Brown  
Chris White  
Clayton Petree

### 1/10-Scale Gas Truck

Dale Ferry  
Craig Ricci  
Todd Shreve

### Newcomer Class

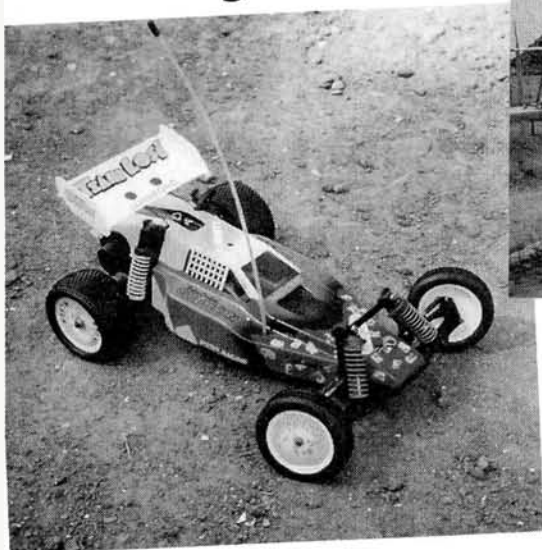
Jarrod Anderson  
Mark Wignall  
Brian Schmidt



*Top to bottom: this impressive display of trophies is a CRA trademark; everyone goes home with something. The 2WD buggies line up on the starting grid. The huge double jump in front of the drivers' stand kept the turn marshal busy all day. The impressive track layout put everyone's driving skills to the test.*



## Going Dutch



**I**f someone mentions the Netherlands and all you can think of are windmills, tulips and wooden shoes, think again! Better yet—think off-road racing! Robbert Hozee sent in these shots of his club's new, permanent off-road track (above) and explains that R/C racing is rapidly gaining popularity in his area. When the weather gets too cold to race outside, the club members take their buggies to race indoors on the slippery, wooden floor of a nearby gym. Or, if a national title is your pleasure, you can compete against Robbert and his Losi Double-X (left) in the Dutch National Off-Road Championship.





Radio Control Car Action

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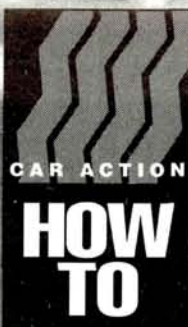
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**A Matter of Record**

# Make Your Own Racing Log

by GARTH FINLEY

**H**AVE YOU EVER forgotten the viscosity of the shock oil you used the last time you drove your car? Maybe you haven't—if you have a wonderful memory, or if you own only one bottle of shock oil. But for those of us who are constantly changing motors and chassis settings to attain the ultimate setup, it can be confusing, and we often forget what we've changed. More important, we might forget how the car actually performed on the track after these changes had been made. Well, folks, why don't you take out paper and pencil and simply record this information in a racer's log?

Preparation at home and efficiency at the track are two important factors that can help you to win races. A comprehensive record can help your setup efforts in both areas and assist you when practice between qualifying heats is a luxury. At a large, 1/10-scale off-road race, the track's surface can vary drastically between qualifying rounds. Can you think of a better aid than a personal diary to help you handle this situation? It can take some of the guesswork out of your decisions.

Now is the time to start keeping a record of your racing. The completed sample page shown illustrates just how thorough your records can be. Believe me, factory drivers go into this much detail to describe their setups to their teammates at large races.

How you keep your records is totally up to you. I've found the best way to keep an accurate log is to use a form that allows me to enter the most information in the least time. Let's face it: at the track, we're always in a hurry.

Keeping records of setups used under a variety of track conditions can give you an advantage when the track's surface varies, and it can boost your confidence in your car before the green flag drops. I encourage you to develop a form that's suitable for your needs and for the type of car you race. An accurate log can give you a winning edge! ■



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Gary W. Dolzall  
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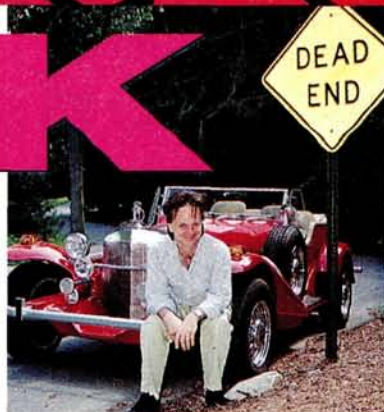
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# BACK LOT



## This is my page—mine!

The opinions expressed on this page do not necessarily represent the opinions of the entire *Car Action* staff. Any resemblance to reality is purely coincidental. Send your correspondence, hate mail, love letters, photographs—anything you like—to Chris's Back Lot, c/o RCCA, 251 Danbury Rd., Wilton, CT 06897. My internet address is: [chrisc@airage.com](mailto:chrisc@airage.com)

## Delivered just in time

**T**his letter came to the office when I was on a long vacation and when my stuff was being moved into a larger space—a dangerous combination of events, when organization (something I never excelled at to begin with) is paramount (as it is in publishing). As a result, it got “filed-in-a-pile,” as it were. At first, I was upset—a Christmas story missed. Then I remembered that it's the January issue, not the December one, that you'll all be reading at the heart of the holiday season.

The December issue is already ancient history. Just in time for the January issue—seemingly of its own volition or moved by some invisible force—this letter was resurrected from under a mass of papers stacked in the “still waiting to be filed pile.” As if by wizardry, it appeared on the floor just to the left of my comfy chair.

In these disillusioning times of political and judicial chaos, it is somewhat comforting to know that we still have one another.

Dear Chris:

My family and I would be in your debt forever if you would print our letter. We recently had a fire in our home and lost almost everything. We were about as down as we could get, sitting in a boring hotel room, when someone suggested that we go to our local hobby shop (Hobby House in Downingtown, PA) to watch our friends in the Sunday races. Well, let me tell you, Chris, we were stunned by what happened. J.T. Nelson (owner of Hobby House) and everyone else there helped us more than they'll ever know.

First and foremost, they gave us the emotional support you can get only from true friends. They helped us get our equipment back in shape. When rain shortened our race day and we were ready to go back to the hotel, we were surprised by a collection J.T. had been taking all day. Considering how few people were there because of the weather, the donation was huge. These people are the best!!

To all the true competitors and friends (one and the same) I say thank you. On that day, and the ones that followed, I was helped by many more, too. Everyone we came in touch with helped in a big way: Eddie, Ron, Marie, Jan, Colin, Jackie, Al, J.T., Gary and anyone I missed, I again say thank you. I would like to thank all of them personally, and, in time, I will. In a sport in which the competitive spirit is high, it's nice to know people can reach out to help those less fortunate. Please print this letter Chris, because right now, it's all we can offer. Thanks

*John K. Smith*

*(also Maryann, Sarah Ann, John Erik and Joshua Raymond Smith—somewhere in Pennsylvania, driving on hotel carpet).*

Dear Smith family:

I think the last thing those people are looking for is a “thank you.” In truth, I'd bet they are the grateful ones—grateful

they were in a position to help. They are, after all, your friends. Merry Christmas.

CC